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PREFACE

Materials of broad scope and which are multifaceted are usually the result of contributions made by many people over an extended time period. This manual is no exception. Over the years, there have been many hours of discussion on and many material contributions made toward the substance of the present manual by the following individuals: Billie Louise Bentzen, R. Victoria Berg, John W. Burke, Michael E. Herron, Laurel (MacWilliam) Hudson, Frederick Silver, W. Robert Smith, Gary R. Snyder, M. Sarah Stanton, Mark Uslan, Hugo R. Vigoroso, William Walkowiak, and George J. Zimmer

The precursor to the present manual was materials in the form of lesson plans generated by W. Robert Smith and utilized in the Peripatology Program at Boston College prior to 1975.

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TABLE OF CONTENTS

SECTION 1. SENSORY SYSTEMS (OUTLINE)

PAGE

I. Cognitive Hierarchy and Movement Hierarchy 1
  A. Cognitive Hierarchy 1
    1. Sensation 1
    2. Perception 1
    3. Imagery 1
    4. Symbolization 2
    5. Conceptualization (Also see Append. C 35-36, D5-14) 2
  B. Movement Hierarchy 2
    1. Reflexes 2
    2. Motor-Sensory 2
    3. Sensory-Motor 3
    4. Perceptual 3
    5. Perceptual-Motor 3
  C. Illustrative Charts
    1. Use of the Cognitive Hierarchy in a Concept Development Model 4
    2. Match of Cognitive and Movement Hierarchies 5

II. Proprioceptive System (Also see Appendix C 1) 6
  A. Define 6
  B. Subsystems 6
  C. Environmental Factors Detectable by the Subsystems 6
  D. Application to Peripatology 6

III. Cutaneous System (Also see Appendix C 5, 6) 7
  A. Define 7
  B. Subsystems 7
  C. Environmental Factors Detectable by the Subsystems 7
  D. Application to Peripatology 7

IV. Olfactory System 7
  A. Define 7
  B. Function/Capabilities 7
  C. Environmental Factors Detectable by the system 7
  D. Application to Peripatology 7

V. Haptic System (Also see Appendix C 5, 6) 8
  A. Define 8
  B. Subsystems 8
  C. Function/Capabilities 8
  D. Application to Peripatology 8

VI. Auditory System (Also see Appendix C 13, 14) 9
  A. Sound Waves 9
  B. Auditory Function/Capabilities 9
  C. Application to Peripatology 11

SECTION 1 (OUTLINE) CONTINUED PAGE

VII. Visual System (Also see Appendix C18-21; C25-30) 12
A. Light Waves 12
B. Sensory Qualities of Color 12
C. Characteristics of Objects and Environs 12
D. Visual (Visual-Motor) Function/Capabilities 12
E. Application to Peripatology 13

SECTION 2 SPATIAL ORIENTATION (OUTLINE) - Also see Append. C-31 15

SECTION 3 ORIENTATION/REFERENCE SYSTEMS (OUTLINE) 18

SECTION 4 TECHNIQUES BASIC TO ORIENTATION AND MOBILITY

I. Sighted Guide 22
A. Objective 22
B. Follower Position 22
C. Guide Position 22
D. Initiating contact for Sighted Guide Technique 23
E. General Movement 23
1. Starting and Stopping 23
2. Following 23
3. Turns 24
4. About Face (Reversing Direction) 24
5. Switching 24
6. Changes in Elevation 25
F. Applications/Modifications 25
1. Narrow Passageways 26
2. Negotiating Doors 26
3. Seating 27
4. Stair Travel 28
5. Elevators 28
6. Escalators 28
7. Mass Transportation 29
8. Hines Break 29
9. Uninformed Guides 30
10. Special Situations 30
G. Discussion Topics 30

II. Protective and Information Gathering Techniques 31
A. Upper Protective Technique 31
B. Lower Protective Technique 32
C. Trailing 33
D. Combined Upper Protective/Lower Protective/Trailing 33
E. Retrieving Dropped Objects 34
F. Handshaking 34
G. Discussion Topics - Protective and Information Gathering Techniques 34

III. Direction Taking Techniques 35
A. Objectives 35
B. Direction Indicator 35

C. Techniques 35
  1. Squaring Off 35
  2. Aligning (Lining Up) 35
D. Discussion Topics - Direction Taking Techniques 36

SECTION 5 CANE TECHNIQUES

I. Cane Control (Sighted Guide) 37
II. Cane Control (Seating) 38
III. Diagonal Cane Technique 39

A. Objectives 39
B. Technique 39
C. Combined Diagonal Cane/Trailing/ Upper Protective Technique 39
D. Object Contact and Exploration 40
E. Object Contact and Clearance 40
F. Cane Control at Doorways 41
G. Discussion Topics - Diagonal Cane Technique 41

IV. Touch Technique

A. Objective 42
B. Technique 42
C. Object Contact and Exploration 43
D. Turns 44
E. Object Contact and Clearance 44
F. Cane Control at Doorways 44
G. Retrieving Dropped Objects 45
H. Discussion Topics - Touch Technique 45

V. Modification of Touch Technique

A. Congested Area 46
B. Two-Point Touch 46
C. Touch and Drag 47
D. Touch and Slide 47
E. Three-Point Touch 48
F. Discussion Topic - Modifications of Touch Technique 48

VI. Modifications of Touch and Diagonal Techniques 49
A. Stair Travel 49
B. Escalator Travel 53
C. Elevator Travel 55
D. Revolving Door Travel 56
E. Discussion Topics - Modifications of Touch and Diagonal Techniques 57

SECTION 6 STREET CROSSINGS

I. Objectives 58
II. Procedure 58
A. Corner Down-Curb Detection 58
B. Approach/Waiting 59
C. Establishing Crossing Direction 60

D. Determining Intersection Configuration 62
E. Determining Traffic Controls 63
F. Determinig Appropriate Crossing Time 65
G. Executing Crossing 66
H. Locating Up Curb 67
I. Exiting Street 68

III. Discussion Topics 67

IV. Special Situation Street Crossings 68
A. Multiple Crossings at One Intersection 68
B. Crossings Perpendicular to Line of Travel 69
C. Areas without Sidewalks 69
D. Crossings from Corners with Blended Curbs 70

V. Corner Location after Veering/Misalignment 71

VI. Discussion Topics - Special Situation Street Crossings 72

SECTION 7 TRANSPORTATION

I. Automobile Travel 74
A. Objectives 74
B. Familiarization to Automobile 74
C. Entering Procedure 74
D. Orientation Enroute 75
E. Exiting Procedure 76
F. Discussion Topics - Automobile Travel 76

II. Taxi Travel

A. Objectives 76
B. Telephoning For Taxi 76
C. Locating Taxi Stand/Hailing Taxi 76
D. Entering Taxi 77
E. Communications with Driver 77
F. Orientation Enroute 77
G. Exiting Taxi 77
H. Discussion Topics - Taxi Travel 77

III. Bus/Trolley Travel 77
A. Objectives 77
B. Familiarization to Vehicles 77
C. Locating Stops 78
D. Identifying/Hailing Vehicles 78
E. Locating Doors 78
F. Boarding Vehicle 78
G. Communications with Driver 79
H. Negotiating Interior 79
I. Orientation Enroute 79
J. Exiting Vehicle 79
K. Discussion Topics - Bus/Trolley Travel 79

Section 7 (Cont'd)

IV. Subway Travel 80
- A. Objectives 80
- B. Familiarization to Station 80
- C. Familiarization to Subway Vehicle 80
- D. Locating Station 80
- E. Entering Station/Platform Area 80
- F. Identifying Approach of Vehicle 81
- G. Boarding Vehicle 81
- H. Negotiating Interior 81
- I. Orientation Enroute 81
- J. Exiting Vehicle 82
- K. Exiting Station 82
- L. Discussion Topics - Subway Travel 82

V. Discussion Topics - Transportation Terminals (Air, Train, Long Distance, Bus) 84

SECTION 8 SPECIAL TRAVEL SITUATIONS

I. Gas Stations 84
- A. Objectives 84
- B. Familiarization 84
- C. Identification 84
- D. Procedures for Passing 84
- E. Recovery after Entry 85

II. Parking Lots
- A. Objectives 85
- B. Familiarization 85
- C. Identification 85
- D. Procedures for Passing 85
- E. Recovery after Entry 86

III. Railroad Crossings 86
- A. Objectives 86
- B. Familiarization 86
- C. Identification 86
- D. Procedures for Crossing Railroad Tracks 86
- E. Procedures with Train Approaching 87

IV. Discussion Topics - Gas Stations, Parking Lots & Railroad Crossings 87

V. Soliciting Sighted Assistance 87
- A. Objectives 87
- B. Degrees of Assistance 87
- C. Procedures for Solicitation 88
- D. Controlling Physical Assistance 88

VI. Locating Destinations 89
- A. Objectives 89
- B. Destinations with Distinctive Landmarks 89
- C. Destinations without Distinctive Landmarks 89

SECTION 8 (Cont'd)

VII. Vehicles Parked Across Sidewalk 90
  A. Objectives 90
  B. Identification 90
  C. Factors Affecting Choice of Direction 90
  D. Procedures for Circumvention 90

SECTION 9 ORIENTATION-RE-ORIENTATION PROCEDURES

I. Familiarizations 91
  A. Objectives 91
  B. Types of Familiarizations 91
  C. Learning Styles 93
  D. Task Size and Complexity 94
  E. Use of Orientation Aids 94
  F. Use of Sighted Assistance 94
  G. External Variables and Constraints 95
  H. Assisted Area Familiarization Procedures 99
  I. Unassisted Area Familiarization Procedures 100
  J. Assisted Route Familiarization Procedures 100
  K. Unassisted Route Familiarization Procedures 103
  L. Rote Course Familiarization Procedures 106
  M. Components of Environments to be Located and Identified 109

II. Re-Orientation Procedures 109
  A. Objectives 109
  B. Applications 109
  C. Procedures 109

III. Drop-Off Lessons 110
  A. Objectives 110
  B. Applications 110
  C. Instructor Procedures 110
  D. Use of Areas 110

SECTION 10 SEQUENCING 112

APPENDIX A: Glossary A.1

APPENDIX B: Guidelines for Construction and Use of Orientation Aids B.1

APPENDIX C: Outlines and Bibliographies

Outline: Motor-Kinesthetic System C.1
Bibliography: Motor-Kinesthetic System/Body Image C.2
Outline: Tactual-Haptic System C.5
Bibliography: Tactual-Haptic System/Tactile Aids C.7
Outline: Auditory System C.13
Bibliography: Auditory System C.15

APPENDIX C: Outlines and Bibliographies (Cont'd)

Outline: Low Vision C.18
Partially Sighted Client C.19
Bibliography: Low Vision C.22
Considerations When Working With Low Vision Students C.25
Basic Variables Affecting Functional Vision C.27
Indoor Functional Vision Evaluation C.28
Functional Vision Evaluation-Outdoors C.29
Functional Vision Evaluation-Intersections C.30
Outline: Spatial Orientation C.31
Bibliography: Spatial Orientation C.32
Outline: Concept Formation C.35
Bibliography: Concept Formation C.37
Parent/Teacher Guides C.40

APPENDIX D: Learning Styles/Experiences

Design of an Early Learning Curriculum D.1
Concept Development D.5
  I. Preliminary Considerations D.5
  II. Developmental Periods D.9
  III. Integration of Orientation and Mobility with School Curriculum D.14
Andragogy D.15
Considerations in Formulation of Learning Experiences D.18
Process vs. Product D.20
Principles of Learning/Teaching A Psychomotor Skill et. al. D.21
Problem Solving Experiences D.22

APPENDIX E: Environments

Analysis of Shopping Malls for the Purpose of Orientation and Mobility Instruction E.1
Factors Related to the Context of A Learning Experience E14a, E14b ← E.14
Major Components of a "Residential" Unit E.15
Major Components of a "Business" Unit E.16
"Rural/Suburban Unit" E.18
Frame of Reference for Analyzing an Intersection E.19
Judgements to Be Made At A Street Crossing E.20
"Snow" Travel E.21
Suggested Activities - Inclement Weather E.22

SECTION I SENSORY SYSTEMS (OUTLINE)

- I. Cognitive Hierarchy and Movement Hierarchy
- II. Proprioceptive System
- III. Cutaneous System
- IV. Olfactory System
- V. Haptic System
- VI. Auditory System
- VII. Visual System

I. Cognitive Hierarchy and Movement Hierarchy

- A. Cognitive Hierarchy (after Johnson and Myklebust, Learning Disabilities; Grune and Stratton, New York, 1967)
  - 1. Sensation: refers to activation of sensorineural structures; response of a sensory receptor to a stimulus; each sensory system reacts to different stimulus.
  - 2. Perception: refers to interpretation of sensory information; attaching meaning to objects, events or situations occurring within the spatial and temporal proximity of the individual; awareness relative to ongoing sensation.
    - a. Pertains to immediately available sensory information interpreted within the context of past experiences.
    - b. Stages of perception (after Dember, Psychology of Perception; Holt, Rinehart and Winston, Inc., New York, 1960).
      - (1) Detection - Awareness; response to change involving a single stimulus.
      - (2) Discrimination - Response to change involving two stimuli; choice between or awareness of differential between stimuli.
      - (3) Recognition - Matching present stimulus with previously learned stimulus.
      - (4) Identification - Appropriately labeling a recognized stimulus.
  - 3. Imagery: refers to sensations or information previously perceived and stored; stored experiences as "sensory images".
    - a. Perceptions produce imagery that is specific to each sensory system. Thus there is visual imagery, auditory imagery, proprioceptive imagery, etc.
    - b. Imagery can be a way in which to describe some of the processes covered by the term "memory".
    - c. Stages of memory (after Dashiell, Fundamentals of General Psychology, 1949.)
      - (1) Acquisition - the organization of response to stimuli in storage.
      - (2) Retention - the permanence or duration of stored response to stimuli.
      - (3) Recognition - a test of learning. The learner is able to recognize previously learned material.

(4) Recall - another test of learning. The learner reproduces the previously learned material without reliance upon immediate stimulus.

4. Symbolization: refers to representation of experience symbolically; includes verbal and non-verbal symbols

a. Verbal symbols - words.

b. Non - verbal symbols

(1) Visual - graphic aid; N.B.C. peacock (R.I.P.)

(2) Tactile - graphic aid (tactile map)

5. Conceptualization: refers to utilization of a symbol to represent a common element from several sensory experiences; includes the ability to abstract and categorize.

a. Concept

(1) An abstract idea combining elements into the idea of one object.

(2) Represents a group of experiences with a common denominator.

(3) The class or category that forms a concept is not in itself observable.

b. Formation of a concept can be assumed when an individual (1) can abstract a common element from several sensory experiences and (2) use this abstraction as a definition of a class and (3) represent this generalization by a symbol.

NOTE: also see Appendix C 35-36, D 5-14

(refer chart entitled "Use of the Cognitive Hierarchy in a Concept Development Model")

B. Movement Hierarchy

1. Reflexes - involuntary responses to external stimuli

a. Infant reflexes (examples from Cratty, Perceptual and Motor Development in Infants and Children, MacMillan, 1979)

(1) Moro reflex - infant spreads his arms and fingers and his legs somewhat weakly, and returns both limbs and fingers to a flexed position against the body. The reflex is usually elicited if the head is shaken quickly. It is present at birth but disappears after approximately 3 months.

(2) Palmar and plantar grasp reflexes - touching the palms of the hands and the front part of the bottoms of the toes of the infant tends to cause flexion of the hands and feet. Evidenced at birth, the reflex is strongest between the 12th day and the third month, weaker by the sixth month and disappears entirely by the end of the first year.

b. Developmental reflexes (examples)

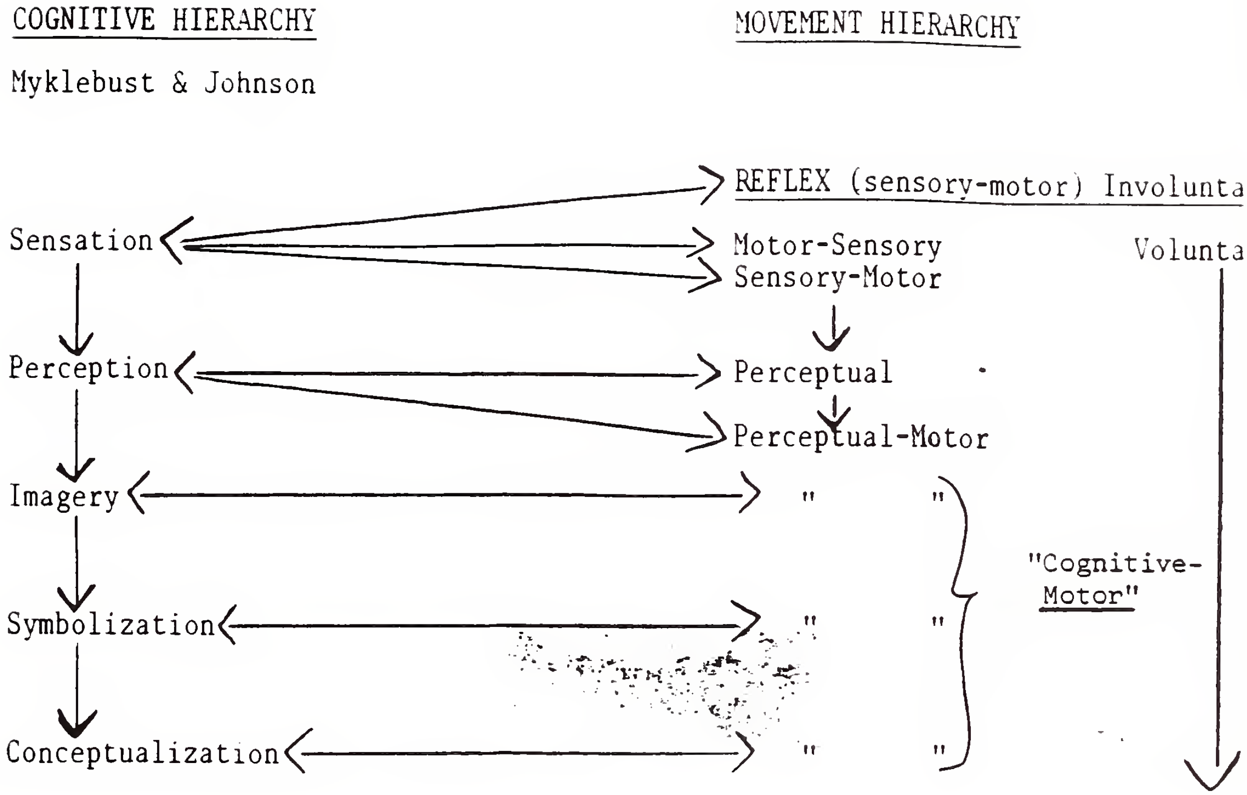
(1) Equilibrium reactions (sitting) - automatic movements of the limbs and trunk upon displacement of the center of gravity. Essential for maintaining a sitting position. Reactions usually appear between 7 and 8 months after birth and continue throughout life.

   - (2) Equilibrium reactions (standing) - automatic movements of the limbs and trunk upon displacement of the center of gravity. Essential for maintaining a standing position. Reactions usually appear between 12 and 21 months after birth and continue throughout life.

2. Motor-Sensory - movement for the primary purpose of motor-muscular development which is monitored by the sensory systems (primarily visual and proprioceptive systems). An example is the random arm and leg thrusts by an infant which do not correlate with external stimuli.
3. Sensory-Motor - movement as the voluntary response to external stimuli. An example is an infant reaching for an attractive visual, auditory or tactile display even without knowledge of what he is seeing, hearing or touching.
4. Perceptual - (refer "Perception", I.A.2., Page 1.1)
5. Perceptual-Motor - movement indicative of a correlation or match between incoming perceptual information and response; movement as response to perceptual activity. Levels of Perceptual-Motor:
   - a. Perceptual - planned movement resultant from immediately available perception of stimulus. An example is an infant perceiving his parent clapping hands and the infant mimics the action by clapping his own hands.
   - b. Imagery - planned movement resultant from "images" of past perceptions. An example is the infant who claps his hands without external stimuli or "prompting".
   - c. Symbolization - planned movement resultant from association with symbols. An example is the infant who claps his hands in response to the words "clap your hands".
   - d. Conceptualization - planned movement resultant from association with a symbol of an abstraction representing a class. An example is a child who claps her hands appropriately in response to the command "Clap your hands twice loudly and three times softly."

COGNITIVE HIERARCHY	VISUAL	HAPTIC	PROPRIOCEPTIVE (BODY PARTS)	PROPRIOCEPTIVE (LOCOMOTOR)	
SENSATION	"straight" lines, edges, etc. are presented	objects with "straight" lines or edges are presented	body parts and positions that are "straight" are presented	A. Walking "straight" line (assisted-sighted guide B. Walking "straight" line (unassisted) C. Walking straight line (with cane)	Haptic/Locomotor Visual/Locomotor Auditory/Locomotor
PERCEPTION	A. Attention is drawn towards.. B. Symbols are applied 1. WORD-'straight' 2. GRAPHIC (Visual) AID	A. Attention is drawn towards.. B. Symbols are applied 1. WORD-'straight' 2. GRAPHIC (Tac-tile) AID	A. Attention is drawn towards.. B. Symbols are applied 1. WORD-'straight' 2. GRAPHIC AID (Visual and/ or Tactile)	A. Attention is drawn towards... B. Symbols are applied 1. WORD-'straight' 2. GRAPHIC AID (Visual and/or Tactile_	
IMAGERY	Visual experiences are stored as visual 'imagery' or visual imaged	Haptic experiences are stored as haptic 'imagery" or haptic images	Proprioceptive experiences are stored as proproceptive 'imagery' or proprioceptive images	Proprioceptive experiences are stored as proprioceptive 'imagery' or proprioceptive images.	
SYMBOLIZATION	Symbolization limited to visual experiences	Symbolization limited to visual and haptic experiences	Symbolization limited to visual, haptic and proprioceptive (body parts) experiences	Symbolization limited to visual, haptic, and proprioceptive (body parts and locomotion) experience	
CONCEPTUALIZATION	Limited experiences yield incomplete concepts	Limited experiences yield incomplete concepts	Limited experiences yield incomplete concepts	Symbols ("straight" and graphic aids) represent the common element (straightness) abstracted from the numerous sensory experiences. Conceptualization may be assumed from behavior based upon utilization of concept	

MATCH OF COGNITIVE AND MOVEMENT HIERARCHIES



II. Proprioceptive System (Also see Appendix Ci)

- A. Define (include and exclude - hunger, thirst, non-skeletal movement)
- B. Subsystems (refer section on cognitive hierarchy for awareness; discrimination; identification)
  - 1. Vestibular (equilibrium; labyrinthine)
    - identify parts, function.capabilities
  - 2. Articular (joints)
    - identify parts, function/capabilities
  - 3. Kinesthetic (muscles)
    - identify parts, function/capabilities
  - 4. Composite function and capabilities
- C. Body Awareness
  - 1. Define
  - 2. Aspects
    - a. Movement Behavior
      - (1) Levels (reflex, motor-sensory, sensory-motor, perceptual, perceptual-motor, cognitive operations)
      - (2) Milestones of Motor Development - Barsch
      - (3) Attributes of Movement - Frostig
    - b. Tri-ordinate System (levels - motor; cognitive)
      - (1) Vertical relationship - gravity
      - (2) Frontal relationship - anatomical
      - (3) Lateral relationship - anatomical/neurological
    - c. Nomenclature - expressive/receptive language
    - d. Description of Function - expressive/receptive language including movement verbs
- D. Environment Factors Detectable by the System (refer cognitive hierarchy)
  - 1. Surface changes - irregularities and conditions causing shift in balance
  - 2. Elevation changes - gradients, drop - offs
  - 3. Direction changes - curves, angles
- E. Application to peripatology
  - 1. Body Awareness
    - a. Movement
    - b. Tri-ordinate system
    - c. Function (Body Part)
    - e. Linear relationships (self-object)
    - f. Spatial Orientation
  - 2. Movement Behavior
    - a. Reaching/Pointing
    - b. Side stepping
    - c. Straight Line Travel/Veer
    - d. Turns
    - e. Time/Distance Judgement
  - 3. Proprioceptive Clues (refer "D" above) (refer characteristics of clues)
    - a. Surface changes
    - b. Elevation changes
    - c. Direction changes
  - 4. Spatial Orientation for #3 above (refer definition of clue and incorporate above)

III. Cutaneous System - refer proprioception (platform for perception).
(Also see Appendix C.5,6)

- A. **Define** (include and exclude - pain, electrical)
- B. **Subsystems** (refer cognitive hierarchy for awareness, etc.)
  - 1. Tactual
    - define, define tactile, function (including vibratory)/ capabilities
  - 2. Thermal
    - define, function/capabilities
- C. Environmental Factors Detectable by the Subsystems
  - 1. Tactual
    - a. Tactile qualities of objects (texture, malleability, etc.)
    - b. Tactile qualities of weather (wind, rain, fog, snow, ice - objects and people)
  - 2. Thermal
    - a. Temperature changes - man-made - heating/cooling units
    - b. Temperature changes - natural; sun/shadow, wind, rain, etc. - objects, people)
- D. Application to Peripatology
  - 1. Tactual
    - a. Clues - refer characteristics of clues
      - (1) Cane - vibratory information to contribute to identify surface textures, substances
      - (2) Hand - tactile qualities of objects for landmarks and symbols on maps and identification
    - b. Guidelines - follow differentiated surface
      - (1) Cane - vibratory information to follow guideline at gas station
      - (2) Hand - follow symbol on a map
    - c. Spatial Orientation - refer definition for clue and use examples from a. & b. above in spatial terms
  - 2. Thermal
    - a. Clues - refer characteristics of clues
      - (1) Man made - air conditioning units; heating ducts; identifying objects
      - (2) Natural - sun; wind at corners; rain (pass under tree or awning)
    - b. Spatial Orientation - refer definition of clue and then repeat examples above (and include sun rising/setting example).

IV. Olfactory System (refer proprioception as platform for perception)

- A. Define
- B. Function/Capabilities (include satiation) (refer cognitive hierarchy)
- C. Environmental Factors Detectable by the System
  - 1. Man made odors
  - 2. Natural odors
- D. Application to Peripatology
  - 1. Clues - refer to characteristics of clues
    - a. Man made odors - object identification; area identification

        b. Natural odors - object identification; area identification
    2. Spatial Orientation - refer definition of clue, etc.

V. Haptic System (Also see Appendix C5,6)

A. Define
B. Role of Subsystems
    1. Tactual - limits set
    2. Proprioceptive - internal spatial information and platform for perception
        a. Body parts
        b. Cane
C. Haptic Function/Capabilities (refer (1) cognitive hierarchy (2) perceptual motor integration sequence)
    1. Scanning - searching a tactile array for a desired object or desired characteristic of objects; may be accomplished with hands, feet or cane.
    2. Localizing - making a judgement of the spatial relationship of objects to self through contact with the object; spatial judgements relate directly to the triordinate system of body awareness.
    3. Tracing - using body parts or the cane to follow the outline of a stationary object; information received may be used to locate parts of objects or contribute to determining the pattern of the object.
    4. Direction Taking - using body parts or the cane to establish a desired line of travel through contact with objects
        a. Perpendicular - placing body, body parts or cane in a perpendicular (right angle) relationship with an object
        b. Parallel - placing body, body parts or cane in a parallel relationship with an object
    5. Paralleling - locomotor alignment of the body using the cane or hands and arms to maintain a parallel relationship with an object; scanning, localizing and direction taking are pre-requisites.
    6. Determining Pattern - making cognitive spatial judgements of the size, shape, form and area of objects through contact with them; scanning, localizing, tracing, direction taking and paralleling are pre-requisites.
D. Application to Peripatology (spatial relationships and spatial orientation)
    1. Scanning - searching tactile aid to locate desired symbol
    2. Localizing
        a. Body Parts
            (1) Distance - extension of arm forward with object contact
            (2) Elevation - back of legs against chair edge
            (3) Azimuth - forearm against door edge
        b. Cane
            (1) Distance - extension of cane and arm forward with object contact
            (2) Elevation - cane used to check elevation of curbs/stairs

        (3) Azimuth - cane lateral position with object contact
    3. Tracing
        a. Body Parts - following guideline on a tactile map to determine building or floor plan shape
        b. Cane - following curb edge or stair edge for direction taking
    4. Direction Taking
        a. Squaring Off (Perpendicular)
            (1) Body Parts - shoulders, arms, legs against wall, etc.
            (2) Cane - tracing curb or stair edge
        b. Aligning (Parallel)
            (1) Body Parts - sweeping arm on wall
            (2) Cane - tracing grass guideline on a sidewalk
    5. Paralleling (locomotor alignment)
        a. Body Parts - using hand to trail a wall
        b. Cane - using cane to trail a wall
    6. Determining Pattern
        a. Size - estimating width of an opening with the cane; estimating size of chair for seating
        b. Shape - differentiating between straight and curved curb with cane; using hands to determine shape of symbols on a map
        c. Form - exploring chair with the hands to determine form
        d. Area - determining configuration of symbols on a map

VI. Auditory System (refer proprioception as platform for perception).
(Also see Appendix C13, C14)
  A. Sound Waves
    1. Define, Describe (include ranges)
    2. Measurement of Sound
        a. Amplitude (intensity)
        b. Frequency - waves per unit time
        c. Wavelength - distance per wave
  B. Auditory Function (auditory-motor)/Capabilities (refer (1) cognitive hierarchy; (2) perceptual-motorintegration sequence)
    1. Perceptual Qualities of Sound
        a. Loudness (Amplitude)
        b. Pitch (Frequency)
        c. Temporal Quality
        d. Tonal Quality
    2. Scanning - searching auditory array for desired sound or sound source
        a. Static - head held stationary; search one of attention
        b. Dynamic - head moved during search
    3. Localizing
        a. Spatial co-ordinates (refer Body Image)
            (1) Distance - major indicator is amplitude (prior knowledge of nature of sound source necessary)
            (2) Azimuth - major indicators are binaural amplitude and binaural time differences
            (3) Elevation - major indicator is sound source relative to pinna and head

- B. Factors Affecting Localization
  - (1) Sound Source
    - (a) Duration - discrete vs. continuous
    - (b) Location - refer spatial co-ordinates
  - (2) Environment
    - (a) Weather Conditions - fog and snow attenuate or mute; rain masks and creates some higher frequencies; wind masks and displaces
    - (b) Masking sounds
    - (c) Sound Shadow
  - (3) Perceiver
    - (a) Clothing and Hair - masking and shadowing
    - (b) Trauma to pinna
    - (c) Head Movement - static/dynamic (refer proprioception)
    - (d) Hearing Imbalance - with and without hearing aid

4. Tracking (pursuit) - perceiver is stationary and the sound source is moving and continuous; localization on a continuum.
   - a. Localization a pre-requisite
   - b. Static - auditory/cognitive only (also verbal expression)
   - c. Dynamic - auditory/cognitive/motor (head and/or arm)
5. Direction Taking - perceiver is stationary and the sound source is moving and continuous
   - a. Localization and tracking are pre-requisites
   - b. Squaring off (Perpendicular)
   - c. Aligning (Parallel)
   - d. Single vs. Series of Sounds and Sound Sources
6. Paralleling - perceiver is moving and sound source is moving and continuous
   - a. Localization, Tracking and Direction Taking (Aligning) are pre-requisites
   - b. Auditory - Cognitive/Locomotor
   - c. Single vs. Series of Sounds and Sound Sources
7. Determining Pattern
   - a. Localization, Tracking and Direction Taking (Squaring Off and Aligning) are pre-requisites
   - b. Cognitive spatial judgements of size, shape, form and area.
8. Detecting Reflected Sound
   - a. Perceiver generated and perceived - "Echolocation"
   - b. Environmentally generated
     - (1) Perception of sound source and reflection
     - (2) Perception of reflection only but not perceived as sound - also called "Facial Vision" "Object Perception" etc.
9. Coordinating Hand and Ear (Hand-Ear coordination)
   - a. Static Sound Source
     - (1) Auditory Localization a pre-requisite
     - (2) Learned abilities - Pointing/Reaching towards and/or touching sound source
   - b. Dynamic Sound Source
     - (1) Auditory Localization a pre-requisite

        - (2) Learned abilities - Pointing/Reaching towards and/or touching sound source
    - b. Dynamic Sound Source
        - (1) Auditory localization and tracking pre-requisites
        - (2) Learned abilities - Pointing/Reaching towards a moving sound source.
- C. Application to Peripatology
    - 1. Clues - refer characteristics of clues
        - a. Identify objects
        - b. Spatial information from sound sources
    - 2. Spatial Orientation
        - a. Scanning - searching the auditory array at an intersection to localize the sounds of idling parallel traffic
        - b. Localizing - determining the location of a known sound source (e.g., a typewriter) as a clue to reaching a desired destination
        - c. Tracking - auditorily following the sounds of pedestrians to determine the location of doors, crosswalks, sidewalks, etc.
        - d. Direction Taking
            - (1) Squaring Off - taking a perpendicular direction from traffic crossing your path at an intersection to judge the location of the far corner
            - (2) Aligning - taking a parallel direction from traffic moving along side your path at an intersection to determine th location of the far corner.
        - e. Paralleling a Sound Source (locomotor alignment) Auditorily aligning with sound sources (traffic) to establish and maintain a desired direction in order to cross a gas station or parking lot.
        - f. Determiming Pattern
            - (1) Size - judging relative size of recessed openings in a business district from echoes.
            - (2) Shape - determining configuration of an intersection based upon traffic flow.
            - (3) Form - determining three dimensional characteristics of a subway station based upon vehicular, pedestrian and other sound sources.
            - (4) Area - determining the configuration of an intersection and surroundings based upon vehicular, pedestrian and other environmental sound sources.
        - g. Detecting Reflected Sound
            - (1) Perceiver generated and perceived - clapping hands or clicking fingers to locate buildings or walls
            - (2) Environmentally generated
                - (a) Location of deeply recessed opening (movie theater) by perception of the sounds of traffic and their echoes from the opening.
                - (b) "Object Perception" - location of walls (and openings in the walls) while travelling indoors
        - h. Coordinating Hand and Ear (Hand-Ear Coordination)
            - (1) A means of communication between teacher and traveler and the public and the traveler.

(2) A means of adding proprioceptive imagery to spatial orientation imagery.
(3) A means of touching, holding or retrieving objects which produce sounds.

VII. Visual System (refer proprioception as platform for perception)
(Also see Appendix C18-21, C25-30)

A. Light Waves
  1. Define, Describe (ranges & spectrum)
  2. Measurement of Light
    a. Wavelength - physical distance between peaks of photon waves
    b. Intensity - number of photons/beam and highest peak/wave

B. Sensory Qualities of Color
  1. Hue (wavelength)
  2. Brightness (intensity)
  3. Saturation (purity)

C. Characteristics of Objects and Environs
  1. Color
  2. Size, Shape, Form
  3. Reflective Quality
  4. Static/Dynamic
  5. Temporal
  6. Contrast (internal)
  7. Figure/Ground
  8. Location

D. Visual (Visual-Motor) Function/Capabilities (refer cognitive hierarchy)
  1. Scanning - searching visual array to find desired object
    a. Static head and body - only eye movement for search
    b. Static body - only eye and head movement for search
    c. Dynamic - eye, head and body movement used for search
  2. Localizing - visually determining location of an object
    a. Scanning a pre-requisite
    b. Spatial Co-ordinates (refer Body Image)
      (1) Elevation - indicated primarily by the eye/head/body position as it relates to gravity
      (2) Azimuth - indicated primarily by the midline of the body as it relates to gravity
      (3) Distance (depth perception)
        (a) Monocular indicators
        (b) Binocular indicators
  3. Tracing - visually following the outline of an object
    a. Object is stationary
    b. Scanning and localizing are pre-requisites
    c. Static/Dynamic head and body
  4. Tracking - visually following a moving object (localization on a continuum)
    a. Object is dynamic
    b. Scanning and localizing are pre-requisites
    c. Static/Dynamic head and body
  5. Direction Taking - visually determining a desired direction or path of travel

        - a. Object may be stationary or dynamic; perceiver stationary
        - b. Scanning, localizing and tracking are pre-requisites
        - c. Perpendicular (squaring off)
        - d. Parallel (Aligning)
    - 6. Paralleling - visually determining and maintaining a line of travel parallel to an object (locomotor alignment)
        - a. Object may be stationary or dynamic; perceiver dynamic.
        - b. Scanning, localizing, tracing, tracking and direction taking (aligning) are prerequisites.
    - 7. Determining Pattern - visual/cognitive determination of size, shape, form and area
        - a. Scanning, localizing, tracing, tracking and direction taking are pre-requisites.
        - b. Objects may be static and/or dynamic; perceiver may be static and/or dynamic
    - 8. Co-ordinating Eye and Hand (Hand-eye coordination)
        - a. Static object
            - (1) Scanning and localizing are pre-requisites
            - (2) Learned abilities are pointing towards (reaching for) and touching a static object.
        - b. Dynamic object (tracking)
            - (1) Scanning, localizing, and tracking are pre-requisites
            - (2) Learned ability is pointing toward (reaching for) a moving object.
    - 9. Co-ordinating Eye and Foot (Foot-eye coordination)
        - a. Static object
            - (1) Scanning and localizing are pre-requisites
            - (2) Learned ability is placing foot on an object
        - b. Dynamic object
            - (1) Scanning, localizing and tracking are pre-requisites
            - (2) Learned ability is placing foot on a moving object
- E. Application to Peripatology
    - 1. Clues - refer characteristics
        - a. Identify objects
        - b. Spatial information from visual sources
    - 2. Spatial Orientation
        - a. Scanning - searching visual array on a street corner to locate a street sign. Static to dynamic scanning affects line of travel and spatial orientation.
        - b. Localizing - visually determining the location of a desired button on a elevator panel. Localization is necessary for the hand-eye coordination required to push the desired button.
        - c. Tracing - visually following the outline or edge of a pole to locate a street sign. Static to dynamic tracing affects line or travel and spatial orientation.
        - d. Tracking - visually following the movement of pedestrians to determine the location of a crosswalk of sidewalk. Static to dynamic tracking affects line of travel and spatial orientation.
        - e. Direction Taking
            - (1) Perpendicular (Squaring Off) - visually establishing a perpecdinular object-to-self relationship

        - (a) Static object - a wall or table
        - (b) Dynamic object - moving traffic
    - (2) Parallel (Aligning) - visually establishing a parallel object-to-self relationship
        - (a) Static object - crosswalk lines
        - (b) Dynamic object - moving traffic
- f. Paralleling
    - (1) Static object - visually following the edge of a lawn for guidance while walking across campus
    - (2) Dynamic object - visually aligning with moving traffic for guidance while crossing an open space such as a gas station.
- g. Determining Pattern
    - (1) Size - visually judging the width of a street
    - (2) Shape - visually determining that the configuration of an intersection is a "T" shape.
    - (3) Form - visually determining the 3 dimensional characteristics of the interior of a bus or a subway car
    - (4) Area - visually determining the sizes, shapes and forms including an intersection and environs
- h. Co-ordinating Eye and Hand (Hand-eye coordination)
    - (1) Static Object
        - (a) Pointing - demonstrating awareness of location of street corners, etc. for communication with an instructor or the public
    - (2) Dynamic object
        - (a) Pointing - demonstrating awareness of position, speed and direction of moving traffic for communication with an instructor
        - (b) Touching - grasping the push bar in a moving revolving door.
- i. Co-ordinating Eye and Foot (Foot-Eye Coordination)
    - (1) Static object - placing the foot on the edge of a stair or curb.
    - (2) Dynamic object - placing the foot on a moving stair of an escalator

SECTION 2
SPATIAL ORIENTATION (OUTLINE)
(Also see Appendix C-31)

Definition: The act(s) of establishing time-space interrelationships (i.e., self to others to objects, etc.), within a context of a reference system. This implies functional body awareness, awareness of objects, effective perceptual-motor behavior and cognitive-concept functioning (e.g. memory; time-object-space concepts, etc.)

Development:

1. by repeated observations and testing of ordered relationships in the perceptual environment.
2. physical structure is learned in three ways: sensory modality(s), symbolic representation, inference (generalized from past experiences).

Meaning:

1. behavioral meaning when a person acts/reacts in the environment, actively trying to bring bodily movements into some degree of conformity with the perceived stimulus pattern.
2. when a person grasps the relation between intention, action and actual consequences, one grasps the pattern.
3. ideas determine the form of an act.

Referent or Reference Point: sensory information (clue) that is utilized to establish or apply an orientation/reference system.

Space:

1. Barsch "Achieving Perceptual-Motor Efficiency"
"an abstraction derived from the relative intervals between and among objects requiring always a referent and a terminal point."
2. Spatial thinking/imagery is derived from the perceptual system as a whole.
3. Imagery and organization results in better memory than does verbal-auditory information.

I. Spatial Theory/Models
   - A. Internal Space
     - 1. Organized around three-dimensional co-ordinates (tri-ordinate system of body awareness)
       - a. Vertical co-ordinate: orientation to gravity (up-down)
       - b. Horizontal co-ordinate: internal awareness of right/left gradient.
       - c. Depth co-ordinate: anatomical front-back
     - 2. Accomplished through interaction with the environment. Barsch refers to equivalency of internal and external tri-ordinate.
   - B. External Space
     - 1. Zones of Space - Barsch (extent of space)
       - a. Near space - 2 ft. in all directions; reach, grasp and release; area of manipulation; contact possible with all sensory sources without locomotion.
       - b. Mid space - 2-16 ft. in all directions; managed by a few steps in any direction; very close to any homebase or referent.
       - c. Far space - 17-30 ft. in all directions; necessary to function without immediate recourse to home base; zone of extension; not easily organized.
       - d. Remote space - 30 ft. to infinity; lacks clarity and distinctiveness; matter of perspective; primarily abstract-organized primarily on a cognitive level.
     - 2. Levels of Spatial Sophistication - Piaget in Barsch
       - a. Practical space (ages 0-2 1/2) - objects are only sensory in nature and exist only when perceived and always in isolation; objects have no relationship to one another; serve only to stimulate the child.
       - b. Empirical space (ages 2 1/2 - 3) - child as the center of the universe; objects relate directly to himself.
       - c. Objective space (age 3+) - one object among objects; attaining a group of betweenness; achieving awareness of objects relationship to each other.
     - 3. Levels of Orientation (Gibson)
       - a. permanent orientation to the earth-gravity and surface
       - b. temporary orientation to events and objects-whenever attended to.
       - c. oriented locomotion-directing of locomotion to a goal.
       - d. geographic orientation-perceptual system in cooperation.
     - 4. Spatial Judgments (Cratty) - facing, veer, distance, linear relocation, gradient, tilt, geographic orientation.

C. Functional Progression of spatial orientation (determined by the nature and concreteness/abstractness of the referent)
  I. Internal (Tri-Ordinate system of body awareness)
  II. External (assume functioning above practical level)
    a. Egocentric
      (1) Individual as the center of the reference system.
      (2) Projection of internal organization (directionality)
    b. Objective (concrete or abstract)
      (1) Sensory-data (object directionality)
        (a) Rt./left of others; near her (people; vision; definitive)
        (b) Next to that chair (object; vision; relative)
        (c) Near the radio (sensory source; auditory; relative)
      (2) Schematic/Abstract
        (a) Geographical/Political - cities; towns; states; etc.
        (b) Alphabetical - "T" intersections; "L" shaped buildings
        (c) Geometric - 90 degrees; "square"; circle
        (d) Object Configuration - "funnel shaped"
        (e) Cardinal Directions
        (f) Address Systems

II. Knowledge of Spatial Orientation Components-consider contributions of Sensory Systems

A. Internal Space (Body Awareness)
  1. Knowledge of body parts.
  2. Knowledge of space body parts/planes occupy.
  3. Knowledge of relationship of body parts to each other.
  4. Knowledge of relationship of body parts to whole.
  5. Knowledge of 1.-4. above when parts and/or whole are in different position and moving.
  6. Knowledge of space whole body occupies both static and dynamic.

B. External Space
  1. Knowledge of objects, object qualities and object permanence.
  2. Knowledge of the relationship of object to self, self to objects (static and dynamic, direction of movement of self, of others, of objects)
  3. Knowledge of the relationship of objects to objects.
  4. Knowledge of patterns/configurations,

III. Contributors to limitations in Spatial Orientation
- A. Neuromotor integrity
- B. Body Awareness-integrity/differentiation (equivalency of internal and external space.)
- C. Awareness of objects (sensory) - implies identification
- D. Effective perceptual-motor behavior-match vs random movement
- E. Appropriate Cognitive Functioning - refer Cognitive Hierarchy
  - 1. Attention
  - 2. Memory
  - 3. Imagery - appropriate for movement
  - 4. Symbolization - cannot have relationship otherwise
  - 5. Conceptualization - common element from sensory experiences, etc.
    - a. Number of experiences
    - b. Types (sensory)
    - c. Movement (locomotor)
  - 6. Problem Solving
- F. Emotional - stress; inattention
- G. Psychological - distortions of time and space; schizophrenia
- H. Motivational
- I. Environmental

Revised 6/89

ORIENTATION/REFERENCE SYSTEMS (OUTLINE)

Internal Space
- Tri-ordinate system of body awareness

External Space
- A. Egocentric
  - 1. Directionality
  - 2. Clock Analogy
- B. Objective
  - 1. Sensory Data
    - a. Self/Object Directionality
    - b. Self/Objects Directionality
    - c. Object Directionality
  - 2. Schematic/Abstract
    - a. Geographical/Political
    - b. Alphabetical
    - c. Geometric
    - d. Object Configuration
    - e. Cardinal Directions
    - f. Address Systems

External Space

A. Egocentric Reference Systems

The individual is always the referent or focal point of these systems. Space is organized as it relates to the individual's present position. Very concrete systems.

1. Directionality. The projection of the triordinate system of body awareness (internal space) into the environment (external space).
   - a. Frontal plane. Objects are "in front of" or "behind" me.
   - b. Vertical plane. Objects are "above" or "below" me
   - c. Horizontal plane. Objects are to my "right" or "left".
2. Clock Analogy. External space is divided using the spatial layout of a clock. This system uses the individual as the referent in two ways:
   - a. Individual in the center of the clock. Used in this manner, six o'clock is behind, twelve o'clock is in front, three o'clock is directly to the right and nine o'clock is directly to the left.
   - b. Individual at six o'clock. Used in this manner, the individual is at six o'clock, facing twelve o'clock, with nine o'clock in front and to the left and with three o'clock in front and to the right.

B. Objective Reference Systems

The individual's organization of space shifts from an egocentric perspective to spatial organization based partially or wholly on objects or sensory data in external space and finally to spatial organization based upon abstract concepts.

1. Sensory Data. Objects in the environment first serve as secondary referents for spatial organization, then as primary referents for spatial organization.

a. Self/Object Directionality. Using the individual as the primary referent, an object in the environment serves as the secondary referent for organizing space.
   EXAMPLE: "The chair is to the left of the table." "Left" in this example refers to my left, not the left side of the table.
   EXAMPLE: "Put it to the left of the (ticking) clock". Again "left" refers to my left, not the clock's.

b. Self/Objects Directionality. More than one object is used as the secondary referent.
   EXAMPLE: "Your seat is the third desk to the left of the table." "left" here refers to my left, not the left side of the table.

c. Object Directionality. An object or objects become the primary referent for spatial organization.
   EXAMPLE: "Put the chair to his left."
   "Cars travel on the right side of the road."

2. Schematic/Abstract. The primary referent for spatial organization at this level is conceptual in nature. At the highest levels of spatial orientation, the referent is abstract.

   a. Geographical/Political. Any area may be organized by imposing a previously learned geographical/political set of relationships on the area.
      (1) Geographical example: The corridors of a building may be named by oceans; Arctic Ocean, Atlantic Ocean, Gulf of Mexico and Pacific Ocean.
      (2) Political example: The same corridors may be named after states; Wisconsin, Massachusetts, Alabama and California.

   b. Alphabetical. Print alphabetical symbols are useful in organizing and describing areas, routes and various configurations.

      (1) Building and building floor plan configurations are conceptually similar to the following letters:

      H, i, L, C, U, T, Y, V.

      (2) Major travel routes are conceptually similar to the following letters:

      i, L, C, U, P, (Z)

      (3) Many intersections are conceptually similar to the following letters:

      T, L, Y, V, X.

      (4) Some roads are conceptually similar to the following letters:

      U, S.

c. Geometric. Geometric configurations and notations are useful in describing angular relationships of turns, intersecting lines, corridors and streets and in describing area configurations.

(1) Turns. Turns can be described as degrees of a circle:

360° is a full turn
180° is a half turn (reverse direction)
90° is a quarter turn (right angle turn)
45° is a half-right turn

(2) Intersections and Corners. Some individuals find it useful to describe intersecting streets, corridors, sidewalks or walls in geometric terms.

Examples: "The walls meet at a 90° angle."
"The streets meet at a 45° angle."

(3) Area configurations. Very common descriptions of areas include square, circular, rectangular, etc.

Examples: "This room is shaped like a triangle."
"Massachusetts has numerous traffic circles.

(4) Travel patterns. Some travel routes are geometric in configuration such as travel around a block square or rectangular) or around and around (commonly known as "running around in little circles"!)

d. Object Configuration. Objects with distinctive and familiar shapes are often referred to in an analagous way to environmental spatial configurations to assist in spatial organization.

EXAMPLES: "The block is shaped like a braille slate."
"The subway branches out from Kenmore Station like fingers."

e. Cardinal Directions. Use of cardinal directions constitutes the most abstract level of spatial organization. This system utilizes the North Pole as the primary referent. This system is in many ways the most flexible and the most useful because it is the most permanent, absolute, dependable and unchangeable. Cardinal direction systems always use the North Pole as the primary referant and some also use a secondary referent.

(1) Primary referent. North is the prime referent with S exactly opposite it. East is opposite West and they are at 90° angles from North and South.

(a) Travel directions are always relative to the primary referent.

(b) Potential for travel is always relative to the primary referent.

(2) Secondary referents. Cardinal direction systems may also utilize secondary referents for directional and positional designation. These designations are however consistent with the primary referent.

- (a) Egocentric. "It is north of me."
- (b) Object Directionality. "It is west of the building."
- (c) Room wall designation. "The west wall of the room is the east wall of the hall."
- (d) Intersection corner designation. NW, NE, SW, SE. "Walk north to the SW corner."

(3) Positions of the sun. The sun rises in the east and sets in the west.

- (a) Seasons/Northern Hemisphere
  Winter - sun low on southern horizon
  Spring - sun higher towards overhead
  Summer - sun highest overhead (approximately June 21st)
  Fall - sun lower towards southern sky.
- (b) Seasons/Southern Hemisphere. The exact opposite of the Northern in that summer corresponds to our winter, spring to fall, etc. and the sun is in the northern sky.

f. Address Systems. In general, address systems use cardinal directions as the primary referent. It should be noted however that many parts of an address system may be used without any knowledge of cardinal directions.

General "Rules"

(1) Odd numbers are on one side of a street, even numbers on the other.
(2) The address system will begin at a central point downtown (or the center of town).
(3) Numbers will increase as you move away from downtown, decrease as you move towards downtown.
(4) Most numbers in a set are not used (some residential areas are the exception).
(5) Most systems have 100 numbers/block. Others have 50.
(6) Systems may begin numbering at 0, others at 100.
(7) Major businesses (such as department stores) do not use a numbered address.
(8) A designated E-W street divides the system into N-S halves.
(9) A designated N-S street divides the system into E-W. halves.
(10) Some address systems divide a city into quadrants (NW, NE, SW, SE) and use the quadrant designation as part of the address.

Exceptions. Exceptions are created by "T" intersections, apartment complexes, foreign governments (including the city of Boston) and rural conditions.

I. Sighted Guide
II. Protective and Information Gathering Techniques
  A. Upper Protective Technique
  B. Lower Protective Technique
  C. Trailing
III. Direction Taking Techniques
  A. Squaring Off
  B. Aligning

I. Sighted Guide
  A. Objective: To provide the blind person with a basic method of travel using the physical assistance of a sighted individual.
  B. Follower Position
    1. Grasp
      a. The follower should grasp the guide's arm just above the elbow, with the fingers on the inside and the thumb on the outside of the guide's arm.
      b. This grasp position can be facilitated (after initial contact is made) if the guide bends his arm at the elbow.
      c. The grasp should be secure and firm to insure retention in case of a sudden movement or change of pace.
      d. The choice of grasp hand and guide arm is dependent upon safety, comfort and convenience for both guide and follower. However, the follower must grasp the guide's left arm with his right hand or grasp the guide's right arm with his left hand.

    2. Arm Position
      a. The follower's arm should be bent at the elbow to form the letter "L" or a 90 degree angle. The forearm should be approximately parallel to the ground or floor and the upper arm approximately perpendicular to the ground or floor.
      b. The follower's arm should be relaxed, but held close to his side.

    3. Body Postion
      a. Maintenance of the grasp and arm position will place the follower to the guide's side and one half-step behind the guide.
      b. This position affords a degree of protection and permits the follower to walk without stepping on the guide's heels.

C. Guide Position
  1. Arm Position
    a. The guide's arm should be relaxed and may be bent at the elbow or hang to the side. The guide's lower arm (forearm) and hand are thus free to manipulate objects or carry packages.
    b. The guide's upper arm should hang naturally to the side and be held closely to the side. It should be held relatively steady except for intentional signaling.

  2. Body Position
    a. The guide should always walk in front of the follower.
    b. The guide's maintenance of the proper body orientation and arm position will facilitate the follower's maintenance of the prescribed body position.

D. Initiating Contact for Sighted Guide Technique
  1. Guide Initiated
    a. The guide should make physical contact with the follower by placing the back of this hand on his forearm against the hand or forearm of the follower.
    b. Verbal suggestion by the guide will facilitate the process of contact: "Come with me" or "Take my arm and come with me".
    c. The guide's choice of arm can be based upon his observations of the travel environment and follower's free hand.
    d. Guide should position himself so that the follower has to do the minimum of turning and/or moving to get into the prescribed follower position.

  2. Follower Initiated
    a. The follower may contact verbally by requesting to be allowed to take the prospective guide's arm.
    b. This request will be assisted by the follower's extension of his hand and forearm to the basic follower position or the extension of the hand and forearm with a sweeping motion toward the prospective guide.
    c. With an uninformed guide, the follower will, of necessity, describe to the guide the proper procedure for changes in elevation, doorways, congested areas, etc.

E. General Movement
  1. Starting and Stopping
    a. Maintenance of the prescribed guide and the follower positions will allow the follower to develop correct interpretation of the guide's movements.
    b. The follower's correct interpretation of the guide's movements will allow for the development of the proper reaction and timing so that guide and follower have synchronized movements.

   c. The guide may assist the follower in developing the necessary interpretation, reaction and timing by giving a verbal cue which allows the follower to anticipate the movement.

2. Following
   a For general movement, the sighted guide technique is executed with the prescribed guide and follower positions and relationships.
   b. This allows for normal arm swing of both the guide's and the follower's outside arms, unless encumbered with packages or cane.
   c. A walking speed comfortable for both the follower and the guide should be maintained. Thus, a slower speed may be necessary for a beginning follower and a more normal speed for an experienced follower.
   d. The guide must maintain an awareness of the combined width of the guide and follower and make adjustments of his judgement of the width needed for safe passage for both.

3. Turns
   a. Turns are accomplished with the prescribed guide and follower positions and relationships.
   b. Turns are best accomplished if the guide or the follower serve as the pivot point around which the other turns. This will reduce the tendency to sweep wide on turns and thereby lose basic body relationships.
   c. An experienced follower should interpret the guide's movements and turn accordingly but a verbal cue will sometimes be necessary for the beginning follower to anticipate and react to the turn.

4. About Face (Reversing Direction)
   a. In many instances, a reversal of direction may be necessary in areas too congested or narrow for turning as described above. In these cases, an "about face" for direction reversal will be necessary.
   b. After the verbal cue, "Do an about face",
      (1) the guide and follower turn towards each other without losing grasp/arm contact;
      (2) upon facing each other, the guide extends his free hand and makes contact with the follower's free hand/arm;
      (3) with his free hand, the follower assumes the prescribed grasp position on the guide's free arm;
      (4) the original grasp/arm contact is dropped;
      (5) the guide and follower continue turning until the "about face" or 180 degree turn is completed.
   c. If the follower and/or guide are encumbered with package or cane an alternate method may be used. After the verbal cue "Do an about face":

        (1) The grasp/arm contact is dropped:
        (2) Both the guide and the follower complete the "about face" or 180 degree turn independent of each other;
        (3) The cane and/or packages are shifted to the outside arms;
        (4) The guide initiates contact with the followers free arm/hand and the prescribed grasp/arm position is assumed.

5. Switching
    a. In some instances, it may be necessary for the follower to switch from one side of the guide to the other without losing contact.
    b. A switch is accomplished with the following procedure (using guide left arm/follower right arm as the beginning sighted guide position for this example):
        (1) With his left hand, the follower grasps the guides left arm just above the original grasp and both the follower's arms are fully extended;
        (2) The original grasp with the right hand is then dropped and the new grasp with the left hand is maintained by the follower;
        (3) The follower's right hand is then moved across the guide's back locates the guide's right arm and assumes the prescribed grasp on this arm.
        (4) The follower's left hand grasp on the guide's left arm is then released, the left hand is moved across the guide's back and grasps the guide's right arm just above the follower's right hand;
        (5) The grasp with the right hand on the guide's right arm is then released and the follower assumes the prescribed body position and relationship on the right side of the guide.
6. Changes in Elevation
    a. The follower should be informed when the sighted guide team approach an appreciable change in elevation.
        (1) The guide should pause before negotiating any change in elevation so that the experienced follower may anticipate the change in elevation and interpret the guide's arm movement to determine the vertical direction of the change;
        (2) The guide should pause before negotiating any change in elevation and verbally describe the change to allow the inexperienced or insecure follower to anticipate and react appropriately.
    b. The guide should approach changes in elevation in a line perpendicular to the curb or step so that the follower does not arrive at the change of

elevation before the guide nor more than one half-step behind the guide.

F. Applications/Modifications
  1. Narrow Passageways
    a. Should the environment require a reduction in the combined width of the guide and the follower, the guide pulls his arm/elbow tightly to his side, thus signaling the follower to move closer to him.
    b. In many instances, the physical environment requires that the guide and follower walk in a single file. This is accomplished by the following technique:
      (1) the guide moves his guide-arm behind him, placing the hand at or near the center of the small of the back; or by extending arm/elbow straight back;
      (2) the follower interprets this signal and reacts by fully extending his grasp-arm;
      (3) the follower then moves directly behind the guide, thus positioning his extended arm diagonally across his body;
      (4) the guide and follower reduce their speed and shorten their stride to prevent the follower from stepping on the guide's heels.
  2. Negotiating Doors
    a. Open Doors (Automatic doors)
      (1) Open doors are treated as narrow passageways and the prescribed technique is applied.
      (2) No contact or control of the door is required.
    b. Closed Doors
      (1) the guide should indicate the side and direction that the door opens toward eg., "The door opens away and to the right."
      (2) Simutaneously, the guide should give the narrow passageway signal and the follower should assume the prescribed position.
      (3) The guide then opens the door and begins to move forward through the doorway.
      (4) If the door opens toward the follower's free hand side, he grasps and controls the door by sweeping his free hand toward the door from an upper protective technique position. He controls the door as he passes through and closes the door behind him with this hand.
      (5) If the door opens toward the follower's grasp hand side, he must complete a partial switch in order to control the door. The follower places his free hand on the guide's upper arm above the original grasp. This frees the original grasp hand to locate and control the door, again by sweeping from an upper protective technique position. He controls the door as he passes through and closes the door behind

him. He then reverses the partial switch to the original narrow passageway position.
(6) After both have cleared the doorway and door, the guide brings his arm forward to its normal position, signaling the follower to resume the normal following position.
(7) With self-closing doors, the follower need only control the door until he is clear of it and then release it.
(8) The knowledge of the direction (toward-away; right-left) the door opens allows the follower to assume the proper body position and, to anticipate the time his sweep from the upper protective position to search for and control the door.
(9) Interpretation of the guide's arm and body movements assists the follower in reacting to and in the timing of his movements in controlling the door.

3. Seating
   a. Chairs, Benches, Sofas
      (1) The guide should describe the chair or seat to the follower including construction (presence or lack of arms, back; presence of swivel or reclining back) and movability (wheels, rollers, costers, tec.)
      (2) Then the guide should put the follower in contact with the chair; hand on the back edge of the chair; and/or knees/shins in contact with the front edge of the seat.
      (3) The follower should sweep the seat of the chair with one hand to determine if it is clear of objects.
      (4) The follower should then turn around so that the back of his legs or knees touch the chair and sit down.
      (5) If the chair is moveable, the follower will control the movement with his hand or hands while sitting down.
   b. Chairs at Tables
      (1) After describing the situation (including facing direction of chair, table and follower), the guide should place the follower's hand on the back of the chair and the other hand on the edge of the table.
      (2) The follower then pulls the chair out from the table and slides his hand down to the seat to clear it.
      (3) Using his hands on the table edge and the chair seat as reference points, the follower moves in front of the chair sits down and adjusts chair.

- c. Theatre Seats
    - (1) If necessary, the guide and follower may travel the theatre aisles using the narrow passageway technique.
    - (2) If necessary to move through the row of seats, the guide should enter first.
    - (3) The narrow passage way technique may be sufficient to move down the row. If not, the guide and follower will turn sideways and side step but will maintain the grasp/arm contact.
    - (4) Once in front of the empty seats, the guide will put the follower in contact with the arms of the seat for reference.
    - (5) The follower will pull down the seat, clear it, make contact with the seat with the back of the knees of legs and be seated..
    - (6) Upon leaving, the guide will move past the follower towards the aisle so that he may lead out of the row.

4. Stair Travel
    - a. The stairs should be approached perpendicularly.
    - b. Guide should describe the vertical direction of the stairs and stop or pause at the first step.
    - c. The follower should slide one foot forward to locate the base or edge of the step. This serves as the reference point for his first step using his trailing foot.
    - d. The guide proceeds up or down and the follower moves forward, staying one stair step behind the guide.
    - e. The follower should perceive the landing by the forward motion of the guide's arm instead of a continuation of the vertical motion of the guide's arm.
    - f. If physical or emotional factors dictate, the follower should use the hand rail in his free hand.
5. Elevators
    - a. Entrance to or exit from the elevator may dictate a narrow passageway technique.
    - b. If the elevator is small or congested, either method of direction reversal (about face) may be utilized to face the doors.
    - c. If possible, the guide may put the follower in contact with the handrail or elevator wall for support. If not, the follower will have to rely on the guide for balance and support.
6. Escalators
    - a. The guide should describe the approach to the escalator, indicate when the follower should reach for the rail and should stop at the edge of the platform at the moving stairs.
    - b. The follower should slide one foot forward to locate the edge of the platform and should allow the moving rail to slide through his fingers until it is needed for support.

c. The guide will move onto the moving stairs and the follower should step on while maintaining grasp/arm contact and holding tightly to the moving hand rail for support.

d. The follower should stand on the stair step behind the guide with one foot placed on the guide's step (if ascending) or one foot placed over the edge of the step he is standing on (if descending).

e. Clues that the end of the escalator is nearing include the guide's verbal description, the leveling of the hand rail, the equalization of the elevation of the stair steps and the forward movement of the guide.

f. The follower should raise his toes on his leading foot to avoid jamming them into the platform at the end of the escalator and should maintain the grasp/arm contact with the guide.

g. The follower should step off the moving stairs with which ever foot is comfortable and which ever foot reduces stumbling.

7. Mass Transportation

a. Regardless of form of transportation, the guide always leads, grasp/arm contact is always maintained while standing, and contact with hand railings, poles or car walls is assumed for support and balance while standing.

b. The grasp/arm contact may have to be raised or lowered from the prescribed position to the shoulder or forearm/wrist of the guide in order for the follower and guide to maintain contact while negotiating the steep steps on buses or trolleys.

c. A position near the door of the vehicle is desirable for convenience and safety.

8. Hines Break

a. The blind person at times is required to contr unsolicited physical assistance from a sighted person. Often, a statement refusing assistance will cause the sighted person to release his hold on the blind person.

b. If a verbal refusal of assistance or a verbal request that the blind person take the sighted person's arm is not heeded, the blind person may employ the "Hines Break";

(1) The blind person should raise and extend diagonally forward the arm that is being grasped by the sighted person;

(2) The blind person then uses his free hand to grasp the sighted person's hand or wrist;

(3) The sighted person's grasp is then broken by the exertion of downward pressure on his hand/wrist by the blind person;

(4) The blind person may then maintain the hold on the sighted person's hand/wrist and use his free hand to establish a grip on the arm

for sighted guide or drop the sighted person's hand/wrist and terminate the contact with a verbal explanation of the undesirability of physical assistance at that time.

9. Uninformed Guides
    a. If the follower feels that the guide is careless or incapable as a guide, he should first attempt to inform the guide of proper procedures for the guide.
    b. If he feels it necessary, the follower may drop behind the guide as in narrow passageway technique and use the guide as a shield as well as a guide.
    c. The follower may also employ an upper protective technique with his free hand for additional protection.
10. Special Situations
    a. Guiding Two or More Persons
        (1) In guiding two blind persons, the guide may position one follower on each of his arms. Each of these two assume the prescribed follower position.
        (2) In guiding three or more persons, the guide will position the followers so that they occupy as little space as possible and do not sway or swing away from the line or travel.
            (a) The guide will place the first follower on either of his arms in prescribed sighted guide position. The second follower will grasp the first follower's guide arm and he will also assume the prescribed follower position. The third follower will grasp the second follower's guide arm, etc.
            (b) The guide may wish to assemble this line of followers starting from the last follower and working toward the guide position.
        (3) In guiding two persons, the technique for three or more persons may be employed.
    b. Leaving Follower
        (1) If a follower is to be left by the guide, the guide should not ordinarily leave the blind person in open space.
        (2) It is desirable to leave the blind person out of the flow of pedestrian traffic and in contact with a wall, pole, table, etc.
        (3) The guide should make his departure known and should make his presence known upon return.

G. Discussion Topics - Sighted Guide
    1. Uses
        a. Protection
        b. Information

2. Usage by various segments of the V.H. population; Adaptations/Modifications
   a. Adult Adventitious
   b. Adult Congenital
   c. Children
   d. Elderly
   e. Special populations
3. Follower control of sighted guide
4. Follower knowledge of guide roles
5. Body interpretation by follower
6. Guide arm choice
7. Problems caused by incorrect technique.
   a. Posture/Body Orientation
   b. Grasp
   c. Arm position
   d. Body position
8. Rate/Content/Sequence
9. Sensory-Motor Training
   a. Visual information
   b. Proprioceptive information (Body orientation)
   c. Auditory information
   d. Haptic information
10. Concept development
    a. Straight/Curved
    b. Angle/Turn (position, direction)
    c. Distance
    d. Shape/Size
    e. Location
    f. Objects
11. Spatial Orientation
    a. Line of travel
    b. Time/Distance judgement
    c. Depth perception
    d. Turns/Angles
    e. Orientation/reference systems
12. Choosing teaching areas
13. Misc. (running, revolving doors, bed, rest rooms, etc.)

II. Protective and Information Gathering Techniques
   A. Upper Protective Technique (Forearm)
   B. Lower Protective Technique
   C. Trailing
   D. Combined Upper Protective/Lower Protective/Trailing
   E. Retrieving Dropped Objects
   F. Handshaking
   G. Concurrent Items

   A. Upper Protective Technique
      1. Objective: To provide the blind person with a technique offering limited protection for the upper chest, neck and head.

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2. Technique
    a. Position of the Arm
        (1) The upper arm is extended straight forward from the shoulder into a position parallel to the floor.
        (2) The elbow is bent so that the forearm is extended across the body at shoulder or chest height.
        (3) The forearm, wrist and fingers of the hand should form an extended line with the elbow providing protection for one shoulder and the finger tips providing protection for the other shoulder.
    b. Angle of the Arm
        (1) The angle between the upper arm and the forearm forms an obtuse angle of about 110-degrees.
        (2) This angle positions the hand farther forward than the elbow. In this position, the hand rather than the elbow makes contact first allowing for shock absorption at the elbow.
    c. Position of the Hand
        (1) The palm of the hand should be facing forward, away from the body.
        (2) This palm position allows for shock absorption at the wrist and exposes the meaty part of the hand to contact rather than the knuckles and bones.
        (3) The fingers and the thumb are held together.
    d. Choice of Arm
        (1) Either arm may be used in this technique
        (2) Choice of arm should reflect the following considerations: it is preferable to contact objects with the fingers rather than the elbow; and it is preferable to reach across the body to provide overprotection rather than reach away from the body and provide underprotection.

B. Lower Protective Technique
1. Objective: To provide the blind person with a technique offering limited protection for the middle and lower torso.
2. Technique
    a. Position of the Arm
        (1) The arm is held straight and extended diagonally downward and laterally in front of the body.
        (2) The upper arm and forearm are aligned to form an extended straight line from the shoulder.
    b. Position of the Hand
        (1) The hand extends downward from the wrist.
        (2) The knuckles and back of the hand face forward and the palm faces the body.
        (3) The hand is located at the midline of the body and is held from 8 to 12 inches from the body.
    c. Choice of Arm

        (1) Either arm may be used in this technique
        (2) Choice of arm should reflect the following considerations: the technique offers more protection on one side than the other; and it is preferable to reach across the body to provide overprotection rather than reach away from the body and provide underprotection.

C. Trailing (With the Hand)
  1. Objective: To provide the blind person with a technique to follow a smooth surface for one or more of the following reasons:
     a. to move from one position in the environment to another;
     b. to determine one's position in the environment;
     c. to locate objects, tactual information and landmarks;
     d. to establish and/or maintain a line of travel parallel to the surface being followed.
  2. Technique
     a. Position of the Arm
        (1) The arm is held straight, extended forward from the shoulder and positioned diagonally downward
        (2) The angle between the vertical line of the body and the arm is approximately 45 degrees.
     b. Position of the Hand
        (1) The hand extends downward from the wrist.
        (2) The back of the hand faces forward with the palm facing the body.
        (3) The fingers are curled slightly and the back of the finger tips or the nails of the little and ring fingers are in contact with the surface being followed.
        (4) As an alternative, contact may be made by the side of the little finger only.
     c. Position of the Body
        (1) The blind person should maintain normal walking posture.
        (2) The shoulder of the trailing hand should remain 4-6" from the surface being trailed.
     d. Choice of Arm
        (1) Either arm may be used in this technique.
        (2) Choice of arm depends upon the location of the surface to the trailed ~~as~~ the right hand trails surfaces on the right and the left hand trails surfaces on the left.

D. Combined Upper Protective/Lower Protective/Trailing
  1. Travel in Open Space
     a. When traveling in open space, the combination of upper and lower protection techniques is used.
     b. The choice of hand and arm for each technique should reflect the considerations for each technique individually, for both combined and any

        knowledge or judgement concerning the location of objects, obstacles, or landmarks.

    2. Travel While Trailing
        a. While trailing a surface, the free hand/arm can be used in upper or lower protective technique.
        b. The choice of technique employed by the free hand/arm should reflect the knowledge or judgement concerning the location of objects, obstacles or landmarks.

E. Retrieving Dropped Objects
    1. Objective: To provide the blind person with a safe and efficient means of retrieving dropped objects.
    2. Technique
        a. The blind person should face the spot where the object fell or was last heard and then align his body with his head.
        b. Walk to a point short of the estimated location of the object.
        c. Stoop down, keeping the back straight.
        d. To protect head and face in bending down, modify the upper protective technique by placing the hand (with palm forward) approximately one foot in front of the face with the forearm vertical, fingers extending above the level of the head, and the elbow against the chest or rib cage.
        e. Search the area with either or both hands using a circular or rectangular search pattern, making sure to check the area around the feet and between the feet.
        f. If the object is not located, move forward using the modified upper protective technique.
        g. If necessary, lateral movements may be made if the object cannot be located.

F. Handshaking
    1. Objective: To provide the blind person with a means of facilitating introductions and greetings.
    2. Technique
        a. With a sighted person, the blind person should initiate the handshake at the appropriate time by extending his right hand forward and toward the sighted person. The arm should be bent at the elbow.
        b. With another blind person, both should place their right hands at the left side of their own waistlines and then pivot their forearms at the elbow and move their hands to the center of their own bodies. Their hands should meet in the center.

G. Discussion Topics - Protective and Information Gathering Techniques:
    1. Usage by various segments of the V.H. population (factors affecting and modifications)

        - a. Totally blind
        - b. Partially sighted
        - c. Adult adventitious
        - d. Adult congenital
        - e. Children
        - f. Elderly
        - g. Special Populations
    - 2. Protection Afforded - identify and demonstrate
    - 3. Problems caused by incorrect technique
        - a. Posture/Body Orientation
        - b. Arm position
        - c. Hand position
    - 4. Rate/Content/Sequence/Teaching Techniques.
    - 5. Sensory-Motor Training
        - a. Haptic (object identification and exploration)
        - b. Visual
        - c. Proprioceptive
        - d. Auditory
    - 6. Concept Development.
    - 7. Spatial orientation.
    - 8. Factors affecting route selection.
    - 9. Choosing teaching areas/times.
    - 10. Instructor positions during instructions/lessons.

III. Direction Taking Techniques
- A. Objectives - To enable the blind person to establish a definite position in the environment and to establish a line of travel.
- B. Direction Indicator
    - 1. Definition: Any environmental source which may be utilized to establish a line of travel and/or reference point.
    - 2. Examples
        - a. Haptic - walls, curb edges, table edges, benches, sofas;
        - b. Proprioceptive - driveways, ramps, blended curbs, hills, etc.
        - c. Auditory - traffic, music, etc.
        - d. Visual - light sources, colors, etc.
- C. Techniques
    - 1. Squaring Off
        - a. The blind person places his body in a perpendicular relationship to a direction indicator.
        - b. Parts of the body to be used for surface contact and corresponding flat surfaces include:
            - (1) entire back side against wall;
            - (2) back of legs against chairs, benches, sofas;
            - (3) heels against curbs;
            - (4) hands against walls or door frames.
        - c. The entire body is used to establish a perpendicular relationship with the environmental sources listed in III. B.2. b-d. above.
    - 2. Aligning (Lining Up)
        - a. The blind person places his body in a parallel relationship with a direction indicator.

  - b. Sweeping the hand and arm forward and backward on a flat surface allows for the establishment of a flat surface allows for the establishment of a line of travel if the blind person can place his body in a parallel relationship with the direction of the sweep of his arm.
  - c. Trailing a flat surface for alignment allows for the establishment of a line of travel for crossing open spaces such as doorways, intersecting corridors, etc.
  - d. The entire body is used to establish a parallel relationship with the environmental sources listed in III. B.2. b-d above.

D. Discussion Topics - Direction Taking Techniques
1. Usage by various segments of the V.H. population (factors affecting and modifications):
   - a. Totally blind
   - b. Partially sighted
   - c. Adult adventitious
   - d. Adult congenital
   - e. Children
   - f. Elderly
   - g. Special populations
2. Sensory Training
   - a. Tactual-Haptic
   - b. Visual
   - c. Auditory
   - d. Proprioceptive
3. Concept Development
4. Contribution to Spatial Orientation
5. Direction indicators - preferred characteristics
6. Choosing teaching areas/times
7. Instructor positions during instruction/lessons
8. Rate/Content/Sequence/Prerequisites

SECTION 5 CANE TECHNIQUES

I. Cane Control (Sighted Guide)
    A. Objectives - To provide the blind person with the means to efficiently carry the cane and provide limited protection, if necessary, while receiving physical assistance.

    B. Techniques
        1. Behind the Shoulder
            a. The cane is held in a vertical position behind the shoulder and arm, extending downward from the shoulder.
            b. The crook of the cane should touch the shoulder to act as a reference point to maintain the vertical alignment of the cane.
            c. The carrying arm should be held in a relaxed position at the side extended fully downward.
            d. With the back of the hand forward, the shaft should be grasped with the fingers and thumb wrapped around the cane.
        2. Shepherd
            a. The cane is held in a vertical position in front of the shoulder, extending downward from the shoulder.
            b. The carrying arm is held in a position similiar to the sighted guide grasp arm with the elbow bent to form a 90 degree angle.
            c. The cane is grasped with the fingers and thumb wrapped around the cane.
        3. Modified Diagonal (refer Section 5; III.)

    C. Application/Modifications
        1. Negotiating Doors
            a. In situations that require the follower to control doors, either the shepherd or modified diagonal technique is preferable.
            b. If the door opens toward the side on which the cane is being carried, the follower may control the door with the back of the hand which carries the cane.
            c. If the door opens toward the side on which the cane is being carried and is not a self-closing door, the cane may be transferred to the grasp hand. The cane is then held in a vertical position against the outside of the guide's arm with the thumb. This frees the carrying hand to control and close the door.
            d. If the door opens toward the follower's grasp arm side, a partial switch is required. The cane is then held against the guide's arm with the cane carrying hand. Therefore, there is no need for transfer of the cane from hand to hand.
        2. Uninformed Guides
            a. The follower may feel the necessity for advance warning of changes in elevation or feel the need for protection from contact with obstacles when following an uninformed guide.

        b. For advanced warning of changes in elevation, the follower should employ a modified diagonal cane technique with the cane tip in contact with the walking surface.
        c. For protection from contact with obstacles, hold the cane in the shepherd position in front of the shoulder or hip or in the modified diagonal position.
        d. The modified diagonal technique will provide some protection from contact with obstacles but provides no protection from low objects on the cane-carrying hand side.

II. Cane Control (Seating)
    A. Objectives - To provide the blind person with safe, efficient and convenient means of storing the cane.

    B. Techniques
        1. Vertical Storage
            a. The cane may be stored with the tip between the feet, the shaft extending upward in front of the seated blind person and the grip/crook resting against the shoulder.
            b. The cane may also be stored with the tip between the feet and the shaft held vertical in front of the body by grasping the shaft with the fingers and thumb wrapped around the shaft.
        2. Horizontal Storage
        The cane may be stored horizontally on the floor in innumerable instances using a wide variety of storage positions and methods. The following are the major guidelines for horizontal cane storage:
            a. While storing the cane, one hand should be kept on the crook while the tip is kept in contact with the floor. In this manner, the blind person knows where the tip and crook are, thus better controlling the entire cane and avoiding or minimizing unwanted contact with people or objects.
            b. The cane should be stored so that it will not be stepped upon or tripped over. Thus, it should not be extended into aisles. If possible, it should be stored under furniture such as sofas and coffee tables.
            c. The cane should be stored so that it does not obstruct the movement of other pieces of furniture. Thus, it should not be placed between the legs of nearby chairs.
            d. The cane should be stored so that is is easily retrieved when needed. Thus, keeping one foot on the crook makes it easy to locate as well as providing stability against being kicked or rolling away.

        C. Discussion Topics - Cane Control
            1. Applications (Sighted Guide)
                a. Congested Areas
                b. Stairs/Escalators
                c. Sidewalk travel

        d. Hines Break
        e. Doorways
    2. Applications/Modifications (Seating)
        a. Booths
        b. Theaters
        c. Counters
        d. Classroom
        e. Dining
    3. Advantages of folding cane in sighted guide and seating.
    4. Factors Affecting Choice of carrying technique (sighted guide)
    5. Choosing teaching areas/times

III. Diagonal Cane Technique

A. Objectives: To provide the blind person with a cane technique that gives limited protection from objects and warning of changes in elevation.

B. Technique
1. Arm and Hand Position
    a. From a natural, relaxed position, the arm is extended straight forward to form an angle of about 30 degrees to the body. The hand is thus in front of its hip.
    b. The hand is rotated inward and downward so that the inside of the wrist faces downward.
2. Grasp
    a. The cane is grasped such that the top end of the grip rests against the heel of the hand.
    b. The fingers are together and wrapped around the grip.
    c. The thumb is placed along the side of the grip, pointing towards the tip.
    d. The index finger may be substituted for the thumb.
3. Cane Position
    a. The cane is positioned diagonally across the body.
    b. The crook is extended forward providing some protection for the knuckles.
    c. The shaft is extended forward so that the tip is located two inches outside of and in front of the opposite shoulder or widest part of the body.
4. Tip Location
    a. The tip may be held just off the floor to avoid sticking.
    b. The tip may be held in contact with the floor to locate textural/surface changes and to locate changes in elevation.
    c. The tip may be held against a surface to be trailed.

C. Combined Diagonal Cane/Trailing/Upper Protective Technique
1. Variable Affecting Combination with Diagonal Cane
    a. The diagonal cane provides no protection from changes in elevation or low objects under the crook end.
    b. The diagonal cane provides no protection for the upper torso and head.
    c. The diagonal cane may be positioned with either hand.

2. Technique
    a. To locate objects on a wall, trail with the hand nearest the wall the employ the diagonal cane in the opposite hand.
    b. To protect from overhanging objects, use an upper protective technique that positions the protective hand towards the side of the overhanging object and use the diagonal cane in the opposite hand.

D. Object Contact and Exploration
  1. When the object contacted is directly in front of the traveler, the cane tip should be held in contact with the object but moved to a position directly in front of the body.
  2. With the arm fully extended and the cane tip or shaft held in contact with the object, the blind person should move forward until the cane is vertical.
  3. With cane vertical, the point at which the shaft contacts the object (the pivot point) may give some indication of the height of the object.
  4. The free hand should grasp the cane near the grip and slide down the shaft until it contacts the object.
  5. The object is now located and may be explored.
  6. If the object is not directly in front of the traveler, he will have to turn and face the point of contact with the object and then carry out steps D. 2-5 above.

E. Object Contact and Clearance
  1. If the object fully obstructs the traveler's path, the following procedure may be employed:
    a. Approach the object as in D.2. above;
    b. Make a 90 degree turn right or left and trail the object with the free hand or cane tip;
    c. After reaching the end of the obstacle, make a 90 degree turn back to parallel the original line of travel;
    d. Travel may be resumed in the parallel line of travel or the traveler may continue to trail the periphery of the object to relocate the original line of travel.
  2. If the object only partially obstructs the traveler's path, one of the following procedures may be employed:
    a. To attempt to retain the original line of travel:
      (1) Withdraw the cane to the side, holding it in a vertical position with either hand;
      (2) Keeping the cane tip on the floor, extend the arm fully to the side and sweep, thus clearing the area to that side;
      (3) Facing forward step to the side cleared (SIDE STEP) and re-establish the original cane position;
      (4) Travel may be resumed along this line parallel to the original line of travel or traveler may pass the obstacle and side step back to the original line of travel.
    b. Without attempting to retain the line of travel:
      (1) Turn the body at an angle away from the obstacle;

        - (2) Clear with the extension of the cane;
        - (3) Resume travel along this newly established line.

F. Cane Control at Doorways
  1. Approach
    a. The traveler should employ a diagonal cane technique with the tip in contact with the floor (if possible) to locate the door sill (threshold).
    b. After contacting the door or doorsill, the cane tip should be centered in front of the body and held in contact with the base of the door.
    c. Keeping the arm fully extended, the traveler should move forward until the cane is vertical and flat against the door surface. This requires a slight rotation of the crook.
  2. Search Method
    a. The cane tip should be lifted slightly from the floor.
    b. Holding the cane vertically, sweep it across the face of the door from one side of the frame to the other.
    c. If the door has a knob, the cane shaft will contact it and the free hand is used to locate it as described in Section 5. III. D. 4-5. above.
    d. If the door has a push bar, the cane shaft will contact it as the cane is brought to the vertical position. Again, the free hand is used to locate it as described in Section 5. III. d. 4-5.
    e. If the door has a push plate, it is usually flush with the door surface and is difficult to locate when sweeping the cane from side to side.
      (1) If a knob or push bar is not located push on the door to determine towards which side it opens.
      (2) Use the free hand to locate the push plate.
  3. Door Control
    1. The arm has been fully extended during the approach and search phases to reduce the danger of being hit by the door should someone come through from the opposite side.
    2. The choice of hand for the diagonal cane is determined by the side and direction of the door's opening. Thus, the door should be controlled and closed by the most convenient hand with the cane held in the opposite hand.
  4. Negotiation
    1. While passing through the door, the diagonal cane technique with tip in contact should be employed to locate objects and to detect changes in elevation.
    2. After leaving the door area, the cane may be returned to the usual and/or convenient hand.

Discussion Topics - Diagonal Cane
  1. Advantages, disadvantages, limitations of the diagonal cane
  2. Modifications/Applications
    a. Children
    b. Multiple-Handicapped

        - c. Mentally Retarded
        - d. Elderly
        - e. Adults
        - f. Partially Sighted
    3. Choosing teaching areas/times
    4. Rate/Content/Sequence/Prerequisites
        - a. population
        - b. travel areas
    5. Instructor positions during instruction/lessons
    6. Utilization of sensory information/sensory training
    7. Contribution to spatial orientation
    8. Clearing procedure

IV. Touch Technique

A. Objective: To provide the blind person with a systematic means of travel that provides information about the environment and provides protection from obstacles in the traveler's path.

B. Technique

1. Posture
    - a. The traveler should assume his normal standing/walking posture.
    - b. He should be facing forward with his shoulders, torso and feet aligned in the same direction.
    - c. During touch technique, he should not bend or turn at the waist nor should he reach one shoulder farther forward than the other.
2. Grasp
    - a. The cane grip is held in the palm of the hand with the crook curling downward.
    - b. The end of the cane grip is held in contact with the feel of the hand or should extend upwards slightly beyond the heel.
    - c. The index finger is placed along the side of the grip, pointing towards the cane tip.
    - d. The other fingers cradle the cane as they wrap around the grip.
    - e. The thumb is placed over the top of the grip and rests against the edge of the middle finger.
    - f. The grasp should be firm enough to maintain control of the cane but relaxed enough to avoid tension and fatigue.
3. Arm Position
    - a. The arm holding the cane is fully extended forward, without locking the elbow, to form an angle of 30 degrees relative to the vertical line of the body.
    - b. The wrist and hand are centered in front of the mid line of the body so that the arm extends somewhat diagonally across the body.
    - c. When viewed from the side the arm and cane form an extended straight line from the shoulder to the cane tip.

4. Hand Position
    a. The hand is held in front of the midline of the body.
    b. The palm faces inward and the back of the hand outward with the thumb up (hand shaking position).
    c. The wrist is held so that the forefinger and arm form an extended line from fingertip to shoulder.
5. Wrist Action
    a. All movement in touch technique emanates from the wrist. All other arm and shoulder joints are static.
    b. The wrist is moved from side to side through the horizontal plane only.
    c. The wrist is moved so that the hand does not rotate.
6. Arc Width
    a. The cane's arc from side to side should extend from a point 1-2 inches to the left of the widest part of the body to a point 1-2 inches to the right of the widest part of the body and vice versa.
    b. The cane's tip contacts with the walking surface at the arc extremes should be light to avoid excessive noise, sticking, bouncing, or striking more than once at the extreme.
7. Arc Height
    a. The arc of the cane's sweep from side to side should rise no higher than 1-2 inches above the walking surface.
    b. This maximum height is achieved in front of the midline of the body.
8. In-Step
    a. The cane tip should contact the walking surface in front of the trailing foot.
    b. As the traveler steps forward with the left foot, the cane tip should be moving to the right extreme of the arc.
    c. As the traveler steps forward with the right foot, the cane tip should be moving to the left extreme of the arc.
9. Rhythm (Timing)
    a. The cane tip should contact the walking surface at the same time the heel of the forward foot contacts the walking surface.
    b. The cane should be moved smoothly at a constant rate of speed through the entire arc cycle.
10. Stride/Speed
    a. The length of the stride should be even and should be of a comfortable length.
    b. The length of the stride should vary directly with the speed of travel.
    c. The traveler should attain a travel speed comparable to his pre-blindness speed or attain a comfortable, even travel speed.

C. Object Contact and Exploration

The procedure for contact and exploration with touch technique is the same as described for diagonal cane in Section 5. III. D. except that the wrist must be rotated so that the palm moves down-

ward and inward (toward the midline) in order to move the cane to a vertical position.

D. Turns
   1. When making a stationary turn, the traveler should bring the cane tip back to his feet, lift the cane slightly while turning in place.
   2. When making a turn into a open space located by the cane, the traveler should continue moving forward to place his body in the open space before making the turn.
   3. When making a wide sweeping turn while moving, the traveler, should widen his arc to the side towards which he is turning sufficiently to clear the area into which he is turning.

E. Object Contact and Clearance

The procedure for contact and clearance with touch technique is the same as described for the diagonal cane in Section 5. III. E. except that trailing with the cane tip is accomplished by the "Two Point Touch" technique which is described in Section 5. V. B.

F. Cane Control at Doorways
   1. Approach

      The approach is the same as described for the diagonal cane in Section 5. III. F. 1. except for the employment of touch technique and the rotation of the wrist so that the palm moves downward and inward in order to bring the cane to the vertical.
   2. Search Method

      The search method is the same as described for the diagonal cane in Section 5. III. F. 2.
   3. Door Control
      a. The cane arm has been fully extended during the approach and search phases to reduce the danger of being hit by the door should someone come through from the opposite side.
      b. Since touch technique is usually executed with only the usual hand, the door may be controlled by the free hand or the cane may be switched to the opposite hand.
      c. If the door opens to the cane hand side, the door may be controlled by reaching the freehand across the body or switched. A shoulder or foot on the cane hand side may be used to assist in controlling the door.
      d. A non-self-closing door will have to be closed with the free hand which at times will necessitate stopping and stepping back towards the door.
   4. Negotiation
      a. While passing through the door, the touch technique should be employed to locate objects or detect changes in elevation.
      b. As the door is opened, the cane should be extended forward with the tip in contact with the walking surface, and then swept from side to side to clear the area.

c. The traveler should then proceed forward in step.

G. Retrieving Dropped Objects
1. The blind person should follow the roll of the object with his head, or face the point at which the object was last heard.
2. The feet and body should be aligned with the face and head.
3. The cane should be extended forward and laid on the ground in an attempt to place the shaft on the object.
4. The area may be searched with the cane in the following manners:
    a. Holding the crook in place, the cane shaft is swept radially from one side to the other;
    b. The entire cane is moved from side to side, keeping the tip pointing in the same direction and sweeping a rectangular area.
5. The location of the object will be detected auditorily or tactually when the cane contacts it.

H. Discussion Topics - Touch Techniques
1. Function, protective elements, safety factors in reference to each element of the touch technique:
    a. Posture
    b. Arm Position
    c. Hand Position
    d. Grasp
    e. Wrist Action
    f. Arc Height and Width
    g. In-Step
    h. Rhythm
    i. Stride/speed
2. Learning characteristics and special methods of instruction:
    a. Adventitiously blind
    b. Congenitally blind - adults and children
    c. Multiple-handicapped
    d. Mentally Retarded
    e. Elderly
3. Applications/Modifications of Touch Technique for Clients listed in 2. a-e above.
4. Rate/Content/Sequence/Prerequisites
5. Choosing teaching areas/times
6. Instructor positions during instruction/lessons
7. Utilization of sensory information/sensory training
8. Contribution of touch technique to spatial orientation
9. The use of devices to correct or improve technique skills.
10. Cane length - initial evaluation
11. Correcting out-of-step pattern

V. Modifications of Touch Technique
    A. Congested Area Technique
    B. Two-Point Touch
    C. Touch and Drag
    D. Touch and Slide
    E. Three-Point Touch

    A. Congested Area Technique
        1. Objective: To provide the blind person with a travel technique for use in any congested area.
        2. Cane Technique
            a. Bent Arm
                (1) Instead of extending the cane arm, the arm is bent at the elbow and the hand is moved upward and inward at the midline of the body.
                (2) This withdraws the cane tip from full extension to a point closer to the body.
                (3) Posture, hand position, grasp, wrist action, arc height and width, in-step and rhythm remain as in touch technique
            b. Lowered Grasp
                (1) The grasp hand is lowered from the grip onto the shaft.
                (2) The exact location of the grasp on the shaft is determined by the amount of congestion.
                (3) Posture, arm position, hand position wrist action, arc height and width, in-step and rhythm remain as in touch technique.
        3. Altered Stride/Speed
            a. In both cane techniques listed above the cane tip is moved closer to the traveler. Therefore, the forward extent of the cane is lessened and does not provide as much forward coverage.
            b. The stride should be shortened and the speed reduced to avoid overstepping the cane and to allow sufficient time to react to contact with obstacles.

    B. Two-Point Touch (Trailing with Touch Technique) (Shorelining)
        1. Objectives: To provide the blind person with a cane technique for following a surface or line parallel to his path of travel while maintaining the objectives of touch technique.
        2. Cane Technique
            a. The conventional touch technique is employed except that one point of contact at the extreme end of the arc is made on or against a differentiated surface or line parallel to the path of travel.
            b. Posture, arm position, hand position, grasp, wrist action, arc height, in-step, rhythm and stride/speed remain as in touch technique.
        3. Altered Arc Width
            (1) The protrusion of obstacles from the surface being followed prevent traveling close to that surface.

        - (2) Whenever necessary, the traveler should move away from the surface being followed and widen the arc to that side.
        - (3) Widening of the arc should be accomplished without altering any of the other aspects of touch technique.

C. Touch and Drag

1. Objectives — To provide the blind person with a cane technique for locating and/or following a differentiated surface or line parallel to his path of travel while maintaining the objectives of touch technique.
2. Cane Technique
    - a. The conventional touch technique is employed except that the cane tip is dragged from one arc extreme towards the differentiated surface or line being followed.
    - b. Posture, arm position, hand position, grasp, wrist motion arc width, in-step, and rhythm remain as in touch technique.
3. Altered Arc Height
    - a. As the touch and drag is usually executed, the cane is dragged only in one direction, i.e., towards the differentiated surface being followed.
    - b. Under some circumstances, the cane may be left in contact with the walking surface during the entire arc cycle. This is best accomplished on smooth surfaces.
4. Altered Stride/Speed
    - a. The cane tip dragging across the walking surface is usually slower than the cane moving in air.
    - b. To remain in-step and maintain rhythm, the stride should be shortened and speed reduced.

D. Touch and Slide

1. Objectives: — To provide the blind person with a cane technique for locating textural or elevation changes while maintaining the objectives or touch technique.
2. Cane Technique
    - a. The cane tip is held in contact with the walking surface at the extremes of the arc before being moved to the opposite side.
    - b. Since the traveler continues to move forward, the cane tip slides forward on the walking surface for a short distance at both arc extremes.
    - c. Posture, arm position, hand position, wrist action, grasp, arc width and height, and in-step remain as in touch technique.
3. Altered Rhythm
    - a. Since the cane tip is held in contact with the walking surface, the arc cycle takes longer to complete.
    - b. The lengthened arc cycle changes the timing between the arc cycle and the stride/speed cycle.

4. Altered Stride/Speed
    a. In order to maintain the proper rhythm, the stride must be shortened and the speed reduced.
    b. This will allow the cane tip to complete it's lengthened arc cycle.

E. Three Point Touch
    1. Objectives: To provide the blind person with a cane technique for following a differentiated surface while checking an area beyond or above that surface and at the same time maintaining the objectives of the touch technique.
    2. Cane Techniques
        a. The first two points of contact are similiar to those described in the two point touch technique.
        b. The third point is contacted by extending the arc onto, beyond or above the differentiated surface being followed.
        c. This allows the traveler to trail the differentiated surface and to check beyond or above it for landmarks or destinations.
        d. Posture, arm position, hand position, grasp and wrist action remain as in touch technique.
    3. Altered Arc Width
        a. The arc width between the first and second points of contact remains as in two point touch technique.
        b. The arc must be extended to make the third point of contact to check above or beyond the surface being followed.
    4. Altered Arc Height
        a. The arc height between the first and second points of contact remains as in touch technique.
        b. The arc must be raised to check elevated areas above the surface being followed.
    5. Altered In-Step
        a. The co-ordination of the cane tip contact and the heel striking in alternating fashion may be accomplished with the heels striking the walking surface simultaneous with the first and third contacts of the cane tip.
        b. This co-ordination may also be accomplished by maintaining the normal cane contact and heel striking as prescribed for touch technique.
    6. Altered Rhythm
        a. If the in-step co-ordination is accomplished as described in 5. a. above, the arc cycle is much longer than the normal stride/speed cycle.
        b. If the in-step co-ordination is accomplished as described in 5. b. above, the stride/speed cycle is finished before the arc cycle. This will necessitate a pause in the stride/speed cycle after the second contact to allow for the completion of the arc cycle.
    7. Altered Stride/Speed
        a. Regardless of in-step co-ordination and rhythm, the stride length and speed of travel will have to be reduced to accomplish this technique.

- b. This should allow for the simultaneous occurrence of the cane tip contact at the first point of contact and the appropriate alternate heel strike.

- F. Discussion Topics - Modified Touch Techniques
  - 1. Applications/Modifications
    - a. Congested Area Technique
    - b. Two-Point Touch
    - c. Touch and Drag
    - d. Touch and Slide
    - e. Three-Point Touch
  - 2. Variables effecting choice of technique
  - 3. Rate/Content/Sequence/Prerequisites
  - 4. Choosing teaching areas/times.
  - 5. Instructor position during instruction/lessons
  - 6. Utilization of sensory information/sensory training
  - 7. Contribution of techniques to establishing a reference point for spatial orientation.

- VI. Modifications of Touch and Diagnonal Techniques
  - A. Stair Travel
    - 1. Objectives: To provide the blind person with a safe, efficient means of ascending and descending stairs.
    - 2. Identification of Stairs
      - a. Auditory information
        - (1) Sounds of people walking and.or talking on stairs.
        - (2) Echo quality of reflected sound in stairwell.
      - b. Haptic information
        - (1) Perception of cane dropping off first stair.
        - (2) Perception of cane contacting first riser
    - 3. Technique
      - a. Ascending
        - (1) Locating the Riser
          - (a) The riser may be located by using a diagonal cane touch technique, touch and slide or three point touch technique.
          - (b) Check the area above the first riser to determine if stairs have been located.
          - (c) Approach the stairs perpendicularly if possible.
        - (2) Locking the Cane
          - (a) Center the cane tip in front of the body while keeping it in contact with the riser.
          - (b) Rotate the wrist downward and outward so that the cane is brought to a vertical position.
          - (c) Move forward until the feet contact the riser.
        - (3) Positioning the Feet
          - (a) Bring both feet forward so that the toes touch the riser and the feet are parallel to each other.
          - (b) This position will assist in direction taking.

(4) Establishing Position
  (a) Hold the cane vertically and slide it along the edge of the first stair to the left and right to determine the width of the stairs, and the relative lateral position on the stairs. Use the grasp which provides the most control.
  (b) If the stairs are narrow or heavily traveled, move to the right side of the stairs.
  (c) Movement to the right side may be accomplished by the three point touch, two point touch, touch and drag, by trailing with the diagonal cane or sidestepping.

(5) Direction Taking
  (a) Placing the feet parallel to each other and putting the toes of both feet in contact with the riser should align the traveler perpendicularly to the stairs.
  (b) This may be checked by holding the cane vertically in the left hand and sliding the shaft away from the body along the edge of the first stair. The same should be done to the right and the comparison between the angle of extension of the arms outward will assist in the alignment.

(6) Checking Height of First Stair
  (a) With the cane vertical and centered, the cane should be raised to the top of the first stair to determine its height.
  (b) This will affect the judgement of the height of the traveler's first step up.

(7) Checking Depth of First Stair
  (a) With the cane centered and vertical, the cane should be raised to the top of the first stair, then pushed forward to the second riser. This will determine the depth of the first stair.
  (b) This knowledge will affect the judgement of the depth of the traveler's first step up.

(8) Cane Position
  (a) The hand/arm position is a modified diagonal cane position. The grasp and hand positions are similar, but the arm is extended forward to shoulder level. The grasp and arm and hand positions remain stationary while negotiating the stairs.
  (b) The cane is held diagonally across the body with crook in front of one shoulder and the tip in front of the opposite foot. Initially, the cane is raised so that it is in contact with the top edge of the third riser as the traveler stands with his feet against the bottom edge of the first riser. This places the cane 2 risers ahead of the forward foot and this relationship is maintained throughout negotiation of the stairs.

- (9) Negotiating Stairs
  - (a) The arm and hand positions and grasp remain stationary while negotiating the stairs as do the positions of the cane and cane tip.
  - (b) It is the action of the body that moves the cane and cane tip upward and forward from riser to riser.
  - (c) The grasp thumb may be used to apply a slight forward pressure on the cane to assist in the forward motion.
  - (d) The hand rail may be used in crowded areas or where deemed necessary by the traveler.
- (10) Locating the Landing
  - (a) When the cane tip reaches the landing it will fail to contact a riser and move freely forward.
  - (b) When the cane tip reaches the landing, the traveler has 2 more steps before the forward foot reaches the landing.
  - (c) When the cane tip reaches the landing, the wrist should be rotated upward and outward to bring the cane to the touch technique position. The cane is then swept from side to side to clear the landing while still ascending.
  - (d) If possible, sweep to clear so that the traveler reaches the landing "in-step" for a smoother transition to touch technique.

b. Descending
- (1) Locating the Drop-Off
  - (a) The drop-off may be located using touch technique, touch and slide, touch and drag or diagonal cane with the tip in contact with the walking surface.
  - (b) When the cane tip drops over the edge, stop and draw the tip across the walking surface back towards the feet to insure that the nearest drop-off has been located.
  - (c) Then slide the cane tip back over the edge of the drop-off.
- (2) Locking the Cane
  - (a) Center the cane in front of the body while keeping the tip in contact with the edge of the drop-off.
  - (b) Rotate the wrist so that the cane comes to a vertical position and move forward to the edge of the drop-off.
- (3) Positioning the Feet
  - (a) Bring both feet forward to the edge of the drop-off so that the feet are parallel to each other and the toes extend over the edge.
  - (b) This positioning is accomplished while holding the cane tip against the drop-off edge to maintain a reference point on the edge.

(4) Establishing Position
    (a) Slide the cane along the edge of the drop-off to the left and to the right to determine the width of the stairs and the relative lateral position on the stairs.
    (b) If the stairs are narrow or heavily traveled, move to the right of the stairs.
    (c) Movement to the right side may be accomplished by the touch and drag, diagonal cane, technique with the cane tip in contact with the drop-off edge or by sidestepping.

(5) Direction Taking
    (a) Positioning the feet parallel to each other and extending the toes of each foot equally over the drop-off edge should align the traveler perpendicularly to the stairs.
    (b) Checking this alignment with the cane is the same procedure as described for ascending in a.(5) (b) above.

(6) Checking Height of First Stair
    (a) With the cane vertical and centered, the cane should be lowered from the landing to the first stair to determine its height.
    (b) This knowledge will affect the judgement of the traveler's first step down.

(7) Checking Depth of First Stair
    (a) With the cane centered and vertical, the cane should be lowered from the landing to the first stair and the tip should be pushed forward from the riser to the edge of the first stair to determine its depth.
    (b) This knowledge will affect the judgement of the traveler's first step down.

(8) Cane Position
    (a) The hand/arm position is a modified diagonal cane position. The grasp and hand positions are similar but the arm position differs in that is is held further downward than in the diagonal cane technique.
    (b) The cane is held diagonally across the body with the crook in front of one shoulder and the tip in front of the opposite foot. The cane tip is forward of the body so that it is positioned above the edge of the first stair below the landing. This places the cane tip one stair below the forward foot and this relationship is maintained throughout negotiation of the stairs.

(9) Negotiating Stairs
    (a) No-Touch Method. Using this method, the traveler maintains the grasp, hand position and arm position in static alignment. The motion of the body moves the cane tip forward

and downward so that it passes over the forward edge of each stair without contacting any of the stairs. The first point of cane tip contact should be the landing at the bottom of the stairs.

            - (b) Touch Method. Using this method, the traveler uses a slight pulling motion of the wrist so that the cane tip/shaft moves backward and contacts the forward edge of the first stair below the forward foot. The motion of the body moves the cane tip forward and downward over each stair and the wrist pulls the cane tip backward against the forward edge of each stair.
        - (10) Locating the Landing
            - (a) In both the touch and no-touch methods of negotiating stairs, the cane tip should contact the landing at the bottom of the stairs one step ahead of the forward foot.
            - (b) When the cane tip reaches the landing, the wrist should be rotated upward and outward to bring the cane to the touch technique position. The cane is then swept from side to side to clear the landing while still descending.
            - (c) If possible, sweep to clear so that the traveler reaches the landing "in-step" for a smoother transition to touch technique.

B. Escalator Travel

- 1. Objectives: To provide the blind person with a safe and efficient means of negotiating escalators.
- 2. Identification of Escalators
    - a. Auditory information
        - (1) Sounds of people talking on the escalators.
        - (2) Sounds of heels striking the metal plates at the entrance or exit of the escalators.
        - (3) Sounds created by the escalators motors and movement.
    - b. Haptic information
        - (1) Perception of the cane contacting the metal plate or moving hand rail.
        - (2) Perception of the cane contacting the moving stairs.
        - (3) Perception of the vibration of the floor caused by the movement of the escalator.
- 3. Technique
    - a. Approach
        - (1) As much as possible, it is best to approach an escalator from the side to avoid interfering with the pedestrian flow.
        - (2) The horizontal direction may be determined by listening to the pedestrian flow (refer 2.a. (1-2) or by locating the moving handrail.
        - (3) If the escalator is moving away, move onto the metal plate at the opening to the escalator and face the moving stairs.

b. Vertical Direction Determination

(1) Move forward onto the metal plate to a position near the joint between the plate and the moving stairs.

(2) Extend the cane forward and rest it upon the moving stairs.

(3) If the cane tip is pushed upwards and then drops down, the escalator is moving up.

(4) If the cane tip is pulled forward, followed by contact on the bottom of the shaft pushing it upwards, the escalator is moving down.

(5) If possible, this vertical direction determination may be accomplished by listening to the pedestrian flow (refer 2.a. (1-2) above).

c. Alignment

(1) Place the cane in a vertical position and position the tip at the joint between the metal plate and the moving stairs.

(2) Position the feet so that they are parallel and at the edge of the metal plate.

(3) Place the free hand on the handrail, but allow it to slide through the fingers.

d. Boarding

(1) Keeping most of the weight on the back foot, slide the foot onto the moving stairs or step onto the moving stairs, while leaning slightly forward.

(2) Simultaneously, grasp the moving handrail firmly for balance and assistance in moving forward.

(3) Bring the trailing foot onto the stairs in rhythm with the forward movement of the escalator.

e. Ascending Position

(1) Foot Position

(a) Place the forward foot one stair ahead of the other.

(b) Either foot may be used as the forward foot.

(2) Cane Position

(a) If there is no possibility of the cane tip sticking between the ridges on the stair or sticking between the stairs, the cane tip may be placed on the stair surface.

(b) If there is a possibility of the cane sticking, the cane should be held vertically with the tip off the stairs.

f. Descending Position

(1) Foot Position

(a) Place both feet on the same stair.

(b) Position one foot so that the heel rests on the edge of the stair and the toes of that foot are pointed downward over the edge.

(2) Cane position (refer 3.e. (2). (a-b). above)

- g. Exiting
  - (1) Identification of End of Stairs
    - (a) The feet will be forced level to each other at the end of the stairs.
    - (b) The handrail will level at the end of the stairs.
    - (c) There may be auditory information from the pedestrian flow ahead of the traveler.
    - (d) There may be auditory information from the floor area at the end of the escalator.
  - (2) Procedure
    - (a) Raise the toes of the foot which will contact the metal plate at the end of the stairs to avoid stumbling.
    - (b) Step off with either foot, the choice being dependent upon balance and preference.
    - (c) Simultaneous with stepping off, clear the metal plate area with a sweep of the cane.
    - (d) Exit must be continuous and in rhythm with the speed of the escalator to avoid impeding the pedstrian flow exiting behind the traveler.
    - (e) Use touch technique or congested area technique to move away from the escalator.

C. Elevator Travel

- 1. Objectives: To provide the blind person with a safe and efficient means of locating, calling, boarding, and exiting elevators.
- 2. Identification of Elevators
  - a. Auditory information
    - (1) Elevator bell sounds when car arrives at a floor.
    - (2) Sounds of elevator doors opening.
    - (3) Sounds of pedestrian flow in and out of cars.
  - b. Haptic information
    - (1) Location of recessed metal doors with cane.
    - (2) Location of open car with cane.
- 3. Procedure
  - a. Locating Call Button
    - (1) Call buttons are usually located on the wall next to, between or on each side of the elevator door or doors.
    - (2) The button may be located by sweeping the hand up and down along the wall between or next to the elevator doors.
  - b Waiting Position
    - (1) The traveler should face the elevator or back of elevators but stand back from the door to allow for people to exit the car.
    - (2) The cane should be held in a vertical position in front of the traveler for identification and in preparation for movement forward.

- c. Entry
    - (1) The traveler must determine the elevation of the car floor relative to the building floor. This is accomplishded with a modified touch and slide or a modified diagonal cane with the tip in contact with the floor.
    - (2) When moving into the car, conditions may require the use of a congested area technique or the continuation of a diagonal cane.
    - (3) Once inside, the traveler should withdraw the cane tip to his feet, hold the cane vertically and turn in place.
    - (4) The traveler should ride facing the door and be prepared to exit. The cane should be displayed vertically in front for identification to those entering the car.
- d. Exiting Elevator
    - (1) As in entry, the traveler needs to determine the elevation of the car floor relative to the building floor. The is accomplished with the touch and slide of the diagonal cane with the tip in contact with the floor.
    - (2) The traveler should exit the elevator at a moderate rate of speed to allow for people behind him to exit.
    - (3) When moving out of the car, the traveler should clear the area and assume the appropriate technique.

D. Revolving Door Travel

- 1. Objectives: To provide the blind person with a safe and efficient means of locating, entering and exiting revolving doors.
- 2. Identification of Revolving Doors.
    - a. Auditory information
        - (1) Swishing sound created by moving door.
        - (2) Pedestrian sounds entering and exiting.
    - b. Haptic information
        - (1) Cane contact with curved shell that protrudes from the wall.
        - (2) Cane contact with the door itself.
- 3. Procedure
    - a. Approach
        - (1) Since most revolving doors turn counter clockwise and pedestrians enter from the right side and exit from the left, the door should be approached from the right side and the shell contacted.
        - (2) Trail the outside of the shell using the crook of the diagonal cane in the right hand to find the edge of the shell.
    - b. Entry
        - (1) Enter the compartment using an upper protective technique and a diagonal cane to locate and control the revolving door.

(2) With the left hand locate the push bar on the door of the compartment.

c. Negotiation of Door
   (1) The crook of the cane should be held in contact with the stationary shell of the compartment.
   (2) The tip of the cane should be lifted off the floor but held against the door.
   (3) The left hand should be used to push and control the door.

d. Location of Exit
   (1) When the exit opening is reached, the crook of the cane will slip free of the shell.
   (2) When the opening is reached, there will be a sudden change in auditory and cutaneous information.

e. Exit
   (1) When the exit opening is reached, the cane should be swept out of the compartment to clear the exit area.
   (2) The left hand controls the door, until the traveler is completely clear of the door.
   (3) Move clear of the exit area to allow for the exit of pedestrians still in the door.
   (4) Assume the appropriate cane technique in the hand of preference and proceed away from the door.

E. Discussion Topics - Modifications of Touch and Diagonal Techniques
   1. Applications/Modifications.
      a. Stairs - spiral; cane length; railing; outdoor; landings; technique.
      b. Escalators - types location; landings.
      c. Elevators - self-service; orientation enroute; control panels.
      d. Revolving doors - clockwise rotation; iron bars.
   2. Emotional/Intellectual factors in negotiating 1. a-d
   3. Choosing Teaching Areas/times.
   4. Rate/Content/Sequence/Prerequisites.
   5. Instructor positions during instruction/lessons.
   6. Utilization of sensory information/sensory training.
   7. Role of spatial orientation in negotiatin 1. a-d.

SECTION 6 STREET CROSSINGS

I. Objectives: To provide the blind person with the means of executing safe and efficient street crossings without physical assistance.

II. Procedure:
- A. Corner Down - Curb Identification
- B. Approach/Waiting
- C. Establishing Crossing Direction
- D. Determining Intersection Configuration
- E. Determining Traffic Controls
- F. Determining Appropriate Crossing Time
- G. Executing Crossing
- H. Locating Up Curb
- I. Exiting Street

A. Corner Down-Curb Identification
- 1. Proprioceptive Information
  - a. Time/Distance Judgement may be used as follows
    - (1) To anticipate the approach of the corner down-curb;
    - (2) And/or to verify that the down-curb located is distant enough from a previous known landmark to be the corner down-curb.
  - b. Gradients at the corner may be used as follows:
    - (1) To perceive the slope of the sidewalk to the corner down-curb;
    - (2) And/or to perceive the slope of the sidewalk to the parallel down-curb and note that the traveler has not reached the corner down curb.
- 2. Cane Information
  - a. The cane tip will drop-off a down curb and the directional position of the cane's dropping off may assist in determining whether or not the corner down-curb had been located.
  - b. The cane will also contact landmarks which indicate the traveler's presence on the corner.
- 3. Auditory Information
  - a. Primary Sources
    - (1) Vehicular Traffic
      - (a) Parallel traffic may slow or stop at the intersection.
      - (b) Perpendicular traffic will become increasingly closer as the corner down-curb is approached.
      - (c) If the corner is bordered by a building passing the end of the building at the corner will cause a sudden increase in the volume and distance of auditory information from the perpendicular traffic.
    - (2) Pedestrian traffic
      - (a) Pedestrian traffic may be used as a source of auditory information as described in (1), (c) above.

(b) Pedestrian congestion on the corner may be perceived auditorily.

(c) It should be noted that pedestrian traffic is not as structured and controlled as vehicular traffic and thus is not as dependable a source.

b. Secondary Source

(1) Environmental sounds may serve as landmarks for corners or may give indication by their position and distance that a corner down curb is being approached.

(2) The reflected sound of the cane tips contacts on the sidewalk, the traveler's foot steps or traffic will cease when a building line ends. This auditorily perceived "break in the building line" or "open space" may indicate that the corner down-curb is being approached.

4. Thermal Information

a. The Sun

(1) A break in the building line may put the traveler into sunlight or shadow.

(2) This change in heat may indicate that a corner down-curb is being approached.

b. The Wind

(1) A break in the building line may put the traveler into sunlight or shadow.

(2) This change in heat and/or wind force may indicate that a corner down-curb is being approached.

B. Approach/Waiting

1. Locking the Cane

a. Use touch technique or touch and slide to locate down-curb.

b. When the cane tip drops off the corner down-curb, the cane should be slid laterally along the curb edge, until it is centered in front of the body.

c. Holding the cane tip in contact with the curb edge, the wrist should be rotated downward and inward to bring the cane to a vertical position.

d. Using the cane tip as a reference point for the location of the curb edge, slide one foot forward to the curb edge at the point where it contacts the cane.

2. Positioning the Feet

a. With one foot contacting the curb edge, the second foot may be positioned.

b. At square curbs the second foot may be brought even with the first foot at the curb edge.

c. At rounded curbs, the second foot will not be able to be positioned even with the first foot. It may be brought to the curb edge a little in front of or behind the first foot.

d. The feet should be positioned so that one serves as a reference point for the location of the curb edge so that the line of travel is maintained and so that the traveler's balance is stable.

3. Clearing an Area in the Street
    a. After positioning the feet, the cane should be swept through the area in front of the traveler in the street.
    b. If an obstruction is detected in the path of the traveler in the street, a new position on the corner must be located immediately.
    c. A new position on the corner may be established by above the curb edge using a touch and drag or diagonal cane techniques with tip in contact with the curb edge (after the forward area has been cleared).
4. Checking the Height of the Curb
    a. If the height of the curb was not determined in B., 3. above, it should be checked by lowering the cane tip to the street at the curb edge and raising it back over the edge.
    b. Knowledge of the height of the curb will affect the judgement of the height and distance of the first step off the curb.
5. Cane Storage
    a. For visibility to vehicular and pedestrian traffic, the cane should be held diagonally across the front of the body and close to it. The crook should be in front of the grasp arm/shoulder and the tip at or near the opposite foot.
    b. In areas of pedestrian congestion, the cane tip should be very close to the feet, either in the street at the curb edge or above the curb edge.
    c. Where vehicular traffic moves close to the curb edge, the cane tip should be held above the curb edge on the corner.

C. Establishing Direction
1. Line of Travel
    a. If a traveler's line of travel is dependably straight the maintenance of this line through the approach/waiting and execution phases of street crossings should place him at the far corner of a conventional plus sign intersection.
    b. If a traveler's line of travel is broken upon approach/waiting, he may reverse his direction and proceed back along the approach route. After traveling a distance, he should reverse direction again and re-approach the corner to again establish a straight line of travel.
2. Direction Taking (Traffic)
    a. Relationships of Traffic to Traveler
        (1) Perpendicular traffic crosses the traveler's path at a 90 degree or right angle.
        (2) Parallel traffic moves in the same or opposite direction as the traveler.
        (3) Near side traffic occupies the lanes closest to the traveler's side of the street.
        (4) Far side traffic occupies the lanes furthest from the traveler's side of the street.

- b. Procedure
  - (1) After auditorily perceiving the direction of traffic, the traveler projects his line of travel parallel or perpendicular to that perceived direction. He aligns his body with the projected line.
  - (2) Parallel
    - (a) The projection of a line parallel to traffic requires knowledge of the distance the traffic is from the far corner, i.e.; far or near side traffic.
    - (b) Same direction traffic can usually be perceived for a longer period of time in front of the traveler than opposite direction traffic.
    - (c) The critical traffic variables in direction taking from traffic are distance from the far corner and direction relative to the traveler. Therefore, near-side same-direction traffic is usually the easiest to take a direction from and far-side opposite direction traffic is usually the most difficult.
  - (3) Perpendicular
    - (a) As perpendicular traffic is auditorily perceived crossing in front of the traveler, he squares his body off with it and then projects his line of travel forward.
    - (b) Near side traffic is usually easier to perceive and utilize than far side traffic.

3. Direction Taking (Architectural)
   - a. A line of travel directed toward the far corner at a conventional, plus sign intersection may be established by taking a direction from surfaces or lines along the approach to or at the corner of the intersection.
   - b. Procedure
     - (1) Using a touch and drag or a two-point touch technique the traveler may follow a fence line, building line, grass strip, etc. to establish the desired line of travel.
     - (2) The traveler may position the inside of one foot from heel to toe against the straight edge of the sidewalk and align his body with this foot to establish the desired direction for travel.
4. Direction Taking (Square Corners)
   - a. If the corner of an intersection is square, i.e., the curbs met perpendicularly at the intersection, a direction taken from the down curb perpendicular to the traveler's desired line of travel should direct his travel to the far corner of a conventional, plus sign intersection.
   - b. Square Corner Identification
     - (1) Both feet must be positioned so that the curb edge divides each foot at the same place, i.e., the curb edge must lie underneath the balls of both feet. Both feet must be parallel to each other. Align the body with the feet.

            (2) When the cane is held in a vertical position with the tip/shaft against the curb edge and is then extended to arms length at each side, the angle of extension between the arms should be 180 degrees or the arms should not extend in front of or behind the shoulder line.
        c. Procedure
            (1) If the feet are positioned as in 2.b. (1) above, the traveler has squared off with the curb edge and should be directed toward the far corner at a conventional, plus sign intersection.
            (2) In the absence of traffic, the traveler may square off with the base of the curb by stepping into the street and using the backs of the heels to square off.
    5. Direction Taking (Rounded Corners)
        a. If the corner of the intersection is round, i.e., the curbs do not meet perpendicularly at the intersection, the traveler must move away from the corner to locate a portion of the curb which is perpendicular to his desired line of travel.
        b. Rounded Corner Identification
            (1) If the feet are positioned as described in 4.b. (1) above, and the cane is held and extended as in 4.b. (2) above, the angle of extension between the arms will be greater than 180 degrees or the arms will extend in front of and/or behind the shoulder line.
            (2) Any direction taken from a rounded corner will not direct the traveler towards the far corner of a conventional, plus sign intersection.
        c. Procedure
            (1) The traveler must move away from the intersection to the straight portion of the curb which is perpendicular to his desired line of travel.
            (2) The straight portion of the curb may be located by the proprioceptive recognition of the end of a turning phase, or by landmarks or time/distance judgement at a familiar corner.
            (3) When traveling above the street, the traveler may follow the curb edge using a touch and drag or modifications of touch and drag.
            (4) When traveling in the street, the traveler may follow the curb using a two-point touch.
            (5) Having located a straight portion of the curb, the traveler squares off with the curb or curb edge as in 2.b. (1) or 2.c. (2).

D. Determining Intersection Configuration
    1. Consistency Within an Area
        a. In a regular, stable neighborhood, a traveler may sometimes assume that some or many intersections are alike in configuration.

        - b. Having encountered many intersections alike in configuration, the traveler may assume that the one about to be crossed is similar to the previous ones.
    - 2. Auditory Information
        - a. Primary Sources
            - (1) Vehicular Traffic
                - (a) Directional flow of vehicles indicating number, location, angular relationship of streets.
                - (b) Distance from the corner of moving, idling and turning traffic indicating width of streets, location of stop lines, lanes of moving vehicles.
            - (2) Pedestrian Traffic
                - (a) Directional flow of pedestrians indicating number, location, angular relationships of corners and crosswalks.
                - (b) Distance from corner of moving and waiting pedestrians indicating width of streets, location of traffic islands.
        - b. Secondary Sources
          Environmental sources such as fans, air conditioners, bus stops, vendor operated newsstands, sounds emanating from stores, reflected sound, etc, may contribute to judgements of intersection configuration as their nature, direction and distance from the traveler may be correlated to their customary and usual relationship to streets, corners and crosswalks.

- E. Determining Traffic Controls
    - 1. Right-of-Way Laws
        - a. Intersections without visible controls are regulated by the local or state right-of-way laws. The usual and customary law gives the right of way to the car on the right when two cars simultaneously approach an intersection perpendicular to each other.
        - b. If cars do not approach simultaneously in a direction perpendicular to each other, none are required to stop.
        - c. If no cars stop except under the conditions stated in 1.a above, it may be assumed that the only control is the right-of-way law.
    - 2. Yield signs
        - a. A yield sign dictates that vehicles stop before entering the intersection unless it can enter the intersection safely without interfering with the flow of traffic in the intersection or perpendicular traffic.
        - b. If traffic on one street or one side of one street always yields the right of way to perpendicular traffic or traffic approaching the intersection, it may be assumed that the intersection is controlled by a yield sign.
    - 3. Stop Signs
        - a. A stop sign dictates that vehicles always stop before entering the intersection.

b. An intersection with a two-way stop control, i.e., controlled traffic stop and yield the right-of-way to perpendicular traffic.

c. An intersection with a four-way stop control, i.e., traffic on both streets controlled, dictates that all traffic stop before entering the intersection. Then the right-of-way law applies to the intersection.

d. Identification

(1) If cars always stop, regardless of the presence or absence of any other traffic, a stop sign is indicated.

(2) A two-way stop sign is indicated when traffic on one street only stops and when necessary, always yields the right-of-way to perpendicular traffic.

(3) A four-way stop is indicated when traffic on both streets always stop and then proceed according to the right-of-way law.

4. Traffic Signals

a. At intersections controlled by traffic signals, vehicles and pedestrians must proceed according to the signal presented.

b. Traffic signals are cyclic and vary in number of cycles.

c. The traffic cycles are usually in a set and repetitive sequence, e.g., the North-South traffic preceeds the East-West traffic which preceeds the pedestrian walk cycle.

d. A traffic signal cycle may be disrupted or changed by pushing a button to cause the onset of the pedestrian walk cycle.

e. Traffic signal cycles may be of a pre-determined length or be affected by pressure sensitive plates in the street which record traffic volume.

f. Traffic signals may include cycles for turning traffic in one or more directions.

g. Identification

(1) Traffic signals are identified by the cyclic repetitive flow of traffic that does not follow the pattern of any of the controls described in E. 1-3 above.

(2) Vehicles at a traffic signal controlled intersection act in groups rather than individually.

5. Traffic Officer

a. Generally, the traffic officer's authority and control over an intersection supercedes all other controls.

b. Identification

(1) The traffic officer usually controls an intersection with a whistle and verbal commands in addition to gestural signals.

(2) Generally, the traffic officer controls the traffic in a pattern similar to a traffic signal, i.e., cyclic and repetitive flow of traffic.

(3) Vehicles at a traffic officer controlled intersection act in groups rather than individually.

F. Determining Appropriate Crossing Time
  1. Right-of-Way Laws Controlled Intersections
    a. In the absence of traffic, cross when ready.
    b. Cross with parallel traffic in the absence of perpendicular traffic.
    c. Cross in turn with parallel traffic in presence of perpendicular traffic.
    d. In the presence of perpendicular traffic only, wait an appropriate length of time for a break in traffic. If none occurs, extend cane (refer II. G. 1 ahead), and wait for traffic to stop. Cross when traffic is stopped.
    e. If pedestrians are present, use the combination of their movement and traveler's judgements of traffic movement to determine appropriate crossing time.
    f. Judgements arising from vehicle movement supercede information received from pedestrian behavior:
  2. Yield Sign Controlled Intersections
    a. In the absence of the traffic, cross when ready.
    b. Cross the traffic that has the right-of-way.
    c. Cross the right-of-way street with the yield controlled traffic.
    d. In the presence of only perpendicular traffic that has the right-of-way, proceed as in 1.d. above.
    e. Judgements regarding pedestrians are the same as 1. e-f. above.
  3. Stop Sign Controlled Intersections
    a. In the absence of traffic, cross when ready.
    b. Cross with parallel traffic in the absence of perpendicular traffic.
    c. Two-Way Stop
      (1) Cross with parallel traffic which has the right-of-way.
      (2) Cross with the stop-controlled traffic when it is proceeding safely.
      (3) Cross the perpendicular street which has the right-of-way using the procedure described in 1.d. above.
    d. Four-Way Stop
      (1) Cross with parallel traffic.
      (2) Cross perpendicular traffic in the absence of parallel traffic by extending cane (refer II. G.1. ahead) and crossing when traffic has stopped or remains stopped longer than usual.
    e. Judgements regarding pedestrians are the same as in F. 1. e-f. above.
  4. Traffic Signal Controlled Intersections
    a. In the absence of traffic, cross when ready.
    b. Cross with the appropriate signal.
      (1) Green light for parallel traffic.
        (a) Cross with this parallel traffic only at the onset of the green light.
        (b) Onset is determined by the surge of traffic from an idling position at intersection and by the surge of pedestrians from the corner. This is also verified by the previous or simultaneous stopping of perpendicular traffic and the surge of pedestrians.

            - (c) Traveler should be cautioned that the surge of a bus does not necessarily signal the onset of a green light. The same caution applies to cars idling or parked along curbs.
        - (2) Pedestrian Walk Light
            - (a) Cross this light only at its onset.
            - (b) Onset can be determined by the stoppage of traffic in all directions and the surge of pedestrians from and to all corners.
    - c. Cross perpendicular streets in the absence of parallel traffic by noting the temporal patterns of the starting and stopping of perpendicular traffic and crossing as soon as the traffic stops.
    - d. Traveler should be cautioned that one car stopping, buses stopping or cars pulling over to the curb do not constitute traffic stopping for a traffic signal:
    - e. Judgements regarding pedestrians are as related in 1. e-f. above.
- 5. Traffic Officer Controlled Intersections.
    - a. Cross as directed by the traffic officer.
    - b. If no specific directions are given, make a judgement of appropriate crossing time similar to that made at a traffic signal crossing noting both vehicular and pedestrian movement (refer 1. e-f. above)

G. Executing Crossing

- 1. Extension of Cane
    - a. From the waiting position, extend the cane to a centered position with the tip in the street.
    - b. Pause for one second to verify judgement that it is the appropriate time to cross, to signal to traffic that traveler is leaving the curb to cross and to signal the same thing to the instructor.
- 2. Stepping Off
    - a. Step off with the trailing foot or if feet are positioned together, step off with the preferred foot.
    - b. Swing the cane to the appropriate side to get instep at the first step.
    - c. Step off the curb with the foot projected more forward than downward.
    - d. Proceed with a normal or slightly faster than normal stride/speed.
- 3. Traffic Obstruction
    - a. Should traffic obstruct the crosswalk, the traveler will have to circumvent the vehicles.
    - b. If the extent to which the vehicle protrudes into the intersection can be determined by engine sounds or locating distinguishing parts on the vehicle, or locating distinguishing parts of the vehicle, the traveler can decide in which direction he will trail around the vehicle and re-establish his line of travel.
    - c. This judgement will also be affected by the proximity of parallel traffic vs. the inadvisability of traveling behind and between idling vehicles.

- d. The movement of pedestrians around the obstruction will add to the factors affecting the judgement of direction chosen for circumvention.

4. Turning Traffic
    - a. If crossing at the appropriate time, the pedestrian has the right-of-way and the vehicles should stop for them.
    - b. If the traveler judges that the turning vehicles will not stop, he should either not begin the crossing and wait for the next cycle or begin the crossing after they have turned if he judges that sufficient time remains to complete the crossing before the light changes.
    - c. If the traveler is already in the street when traffic turns in front of him, he should allow it to cross in front of him if he judges that it will not stop and then he should complete his crossing.
5. Pedestrian Congestion
    - a. If the crosswalk is congested with pedestrians, the traveler may employ a congested area technique.
    - b. He should be especially cautious to avoid tripping oncoming pedestrians who may not be able to see the cane.
6. Monitoring Direction and Positon
    - a. While executing the crossing the traveler should monitor his direction and position utilizing available sensory information.
    - b. Auditory information available includes parallel vehicular traffic, idling perpendicular traffic, pedestrian sounds and sound sources on the far corner.
    - c. Proprioceptive information available includes time/distance judgements, perception of the crown in the street and perception of other drainage gradients.
    - d. Haptic information available includes cane contact with traffic islands, curbs and parked vehicles.
    - e. Cutaneous information is generally unreliable except in cases of gross judgements rather than specific, refined judgements.

H. Locating Up Curb

1. Maintenance of the line of travel should direct the traveler to the up curb.
2. Perception of drainage gradients will indicate the location of the up curb.
3. Cane techniques
    - a. Contacting Curb Edge
        - (1) Maintainence of the prescribed arc height should enable the traveler to contact the curb at or near its base.
        - (2) The cane should be moved to the midline of the body and tip held against the curb edge.
    - b. Locking Cane
      Hold the cane tip against the curb edge and rotate the wrist so that the cane is brought to the vertical position.
    - c. Positioning the feet
      Move forward and place one foot against the curb edge near the cane tip as a reference point for the location of the curb.

- I. Exiting the Street
    - 1. The cane should be lifted over the curb edge and swept in front of the traveler to clear the area above the curb.
    - 2. Step up onto the corner and proceed in-step or stop and start again in-step.
    - 3. If the area above the curb is obstructed, move away from the obstruction utilizing a three-point touch technique to locate a clear area above the curb.

III. Discussion Topics - Street Crossings

- A. Developing spatial orientation to intersections.
- B. Recognition of offset, T, complex intersections.
- C. Variables affecting choice of direction taking procedure/ combinations.
    - 1. Populations.
    - 2. Travel environments.
- D. Direction taking (traffic)
    - 1. Principle of convergence.
    - 2. Slow moving/congested traffic.
    - 3. Variables determining choice of traffic to utilize/ degree of difficulty.
    - 4. Vehicles changing lanes.
- E. Appropriate crossing time.
    - 1. Masking sounds.sound shadow.
    - 2. Weather conditions.road conditions.
    - 3. Speed of traffic/reaction time.
    - 4. Curves/hills.
    - 5. Types of walk lights.
    - 6. Pedestrian considerations.
    - 7. Local customs regarding pedestrian rights.
    - 8. Local customs regarding traffic controls.
- F. Effects of one-way streets.
- G. Instructor positions during instruction/lessons.
- H. Rate/Content/Sequence/Prerequisites
    - 1. Area or geographical considerations
    - 2. Population considerations.
- I. Choosing teaching areas/times.
- J. Coping with parked vehicles before/after crossings.
- K. Coping with pedestrians congestion at corners.
- L. Veer/Turn recognition when following a curb.
- M. Location of straight portion of a curb.
- N. Factors affecting sequence of traffic control listing in this manual.
- O. Utilization of secondary/environmental sources of auditory information.
- P. Crossings to/from traffic islands.

IV. Special Situation Street Crossings

- A. Multiple Crossings at One Intersection
    - 1. Objective: To enable the blind person to safely and efficiently cross more than one street at an intersection.

2. Procedure
    a. The traveler should make the first crossing using one or more of the procedures described in II. D. above.
    b. If the crossing accurately brings the traveler to far corner the traveler should clear, step up, move forward to the mid-point of the corner, and make a 90 degree turn towards the street to be crossed.
    c. If the turn was accurate, the traveler should be facing the desired corner. He should approach, wait, determine appropriate crossing time and execute the crossing. His line of travel can be verified before crossing by using auditory information.
    d. If the crossing or turn were inaccurate, the traveler should initiate crossing procedures as described in II above.

B. Crossings Perpendicular to line of Travel
  1. Objective: To enable the blind person to efficiently cross the street parallel to his original line of travel.
  2. Procedure
    a. The traveler should locate the down-curb in front of him, make an 180 degree turn, take 3 or more steps, make a 90 degree turn in the direction of the street to be crossed and approach the downcurb.
    b. If his approach and turns were accurate, he should be facing the desired corner. This may be verified before crossing by utilizing auditory information.
    c. If the crossings or turns were inaccurate, the traveler should initiate crossing procedures as described in II. above.

C. Areas Without Sidewalks
  1. Travel Procedure
    a. Utilize a two point touch or touch and drag to follow a guideline (curb, street edge, grass line, etc.) while walking at the side of the street.
    b. If the street is narrow and near-side traffic dangerously close, step out of the street when vehicles approach on the near side of the street.
    c. Travel facing near-side traffic whenever possible unless obstruction or location of destination dictates otherwise.
  2. Travel Around Parked Vehicles
    a. Wait for a break in traffic and then trail around the vehicle using the hand and/or cane until the guideline is relocated.
    b. If the vehicle is large, an upper protective is required to protect against head contact with rear view mirrors.
    c. If traffic is particularly heavy and/or dangerously close, travel around the vehicle on the guideline side if possible.
  3. Corner Recognition
    a. Proprioceptive Information
      (1) Time/distance judgement will allow for anticipation of the approach to the corner and/or verify if the traveler has gone far enough to reach a corner.

            - (2) Gradients at an intersection may be perceived as the street level changes to allow for drainage.
            - (3) The perception of turns will signal that the line of travel is curving, possibly around a corner.
        - b. Auditory Information
          refer II. A. 3. p. 58.
        - c. Cutaneous Information
            - (1) refer II. A. 4. p. 59.
            - (2) As a guideline is being followed around a turn or a corner, relationship of the sun and wind will change with respect to the traveler.
    - 4. Crossing Procedure
        - a. The traveler should travel around the corner and move away from the parallel street to a straight portion of the guideline.
        - b. He should square off with the guideline and prepare to cross at a point which will enable him to cross the perpendicular street only.
        - c. Procedures for determining traffic controls, and appropriate crossing time and executing crossings apply here as described in II. E-G. p. 63-67.
        - d. Upon reaching the guideline across the street, the traveler should turn towards the parallel street and follow the guideline around the corner to the parallel street and continue following the guideline.
        - e. To cross the parallel street, the traveler should travel until the corner is detected, reverse direction until the straight portion of the guideline is located and square off with the guideline. Proceed as in 4.c. and d. above.
        - f. To cross both streets at one intersection, the procedure for crossing the perpendicular street must be repeated for each crossing.

- D. Crossings from Corners with Blended Curbs
    - 1. Corner Recognition/Detection
        - a. Proprioceptive Information
            - (1) Time/distance judgement will enable anticipation of approach to corner and/or verify if the traveler has gone far enough to reach a corner.
            - (2) Gradients at the corner may be perceived as the sidewalk slopes to meet the street.
            - (3) The differential in gradient caused by the joining of the different gradients of the sidewalk and the street may be perceived.
        - b. Haptic Information
            - (1) Using a touch and slide technique, the expansion joint between the sidewalk and the street may be detected.
            - (2) The traveler may detect the change in surface texture between the sidewalk and the street.
        - c. Auditory Information
          (refer II. A. 3. p. 58.)

        d. Cutaneous Information
            (refer II. A. 4. p. 59.)
    2. Approach/Waiting
        a. The traveler should stand slightly back from the expansion joint after having cleared the area in front of him in the street (refer II. B. 3. p. 60.) and position his cane as in II. B. 5. a. p. 60.
    3. Determining Intersection Configuration
        (refer II. C. p. 60.)
    4. Establishing Direction
        (refer II. D. 1., 3.4., 5. p. 62.)
    5. Determining Traffic Controls
        (refer II. E. p. 63.)
    6. Determining Traffic Controls
        (refer II. F. p. 65.)
    7. Executing Crossing
        (refer II. G. p. 66.)
    8. Exiting Street
        a. If a curb is encountered on the far corner, then proceed as in II. I. p. 68.

V. Corner Location after Veering/Misalignment

A. Monitoring Course

1. Utilize sensory information as described in II. G. 6.
2. Travel into parallel street is recognized in the following ways:
    - a. Proprioceptive information
        - (1) comparison of distance traveled during crossing vs. original estimate of width of perpendicular street.
        - (2) Perception of changing direction of street gradients.
        - (3) Comparison of distance from starting corner to crown vs. distance from crown to present location.
    - b. Haptic Information
        - (1) Contact with parallel vs. perpendicular curb.
        - (2) Contact with front or back of parked vehicle vs. contact with sides of parked vehicles.
        - (3) Contact with idling parallel vehicular traffic.
    - c. Auditory Information
        - (1) Proximity of parallel traffic sounds vs. distance of perpendicular traffic sounds.
        - (2) Location of pedestrian sounds.
        - (3) Location of far corner sounds relative to present position.
    - d. Cutaneous Information
        Cutaneous information is generally unreliable except in cases of gross judgements rather than refined, specific judgements.
3. Travel away from the parallel street is recognized in the following ways:
    - a. Proprioceptive Information
        - (1) Perception of distance traveled compares closely with original estimate of width of perpendicular street.

            - (2) Perception of gradients sloping to curb.
            - (3) Comparison of distance from starting corner to crown vs. the distance from the crown to present location is very close.
        - b. Haptic Information
            - (1) Contact with perpendicular curb.
            - (2) Contact with sides of parked vehicles.
            - (3) Contact with idling perpendicular traffic.
            - (4) Contact with objects usually located away from corner.
        - c. Auditory Information
            - (1) Proximity of perpendicular traffic sounds vs. distance of parallel traffic sounds.
            - (2) Location of pedestrian sounds.
            - (3) Location of far corner sounds relative to present position.
        - d. Cutaneous Information.
          (refer 2.d. above)

- B. Recovery Procedure
    - 1. From position in parallel street:
        - a. If the traveler has not yet passed the far corner he should make a course correction and travel directly to the far corner, clear and step up.
        - b. If the traveler has passed the far corner, he should apply the following procedure.
            - (1) Turn immediately towards the known or judged location of the nearest curb.
            - (2) Travel quickly to this curb, clear and step-up (if possible). Establish desired direction.
            - (3) If area above curb is obstructed, traveler should turn towards perpendicular street and follow the curb utilizing a three point touch technique to locate the corner or a clear area to step up and locate corner.
    - 2. From position away from the parallel street:
        - a. If the traveler has not yet located the curb, he should turn immediately towards the known or judged location of the nearest curb.
        - b. Travel quickly to this curb, clear and step-up (if possible), turn towards parallel street and locate corner.
        - c. If the area above the curb is obstructed, traveler should turn towards the parallel street and follow the curb as described in B. (3). above to locate the corner or a clear area to step up and locate corner.

VI. Discussion Topics - Special Situation Street Crossings
- A. Role of spatial orientation:
    - 1. Multiple crossings at one intersection
    - 2. Crossings perpendicular to line of travel
    - 3. Areas without sidewalks
    - 4. Crossings from corners with blended curbs

    5. Corner location after veer/misalignment

B. Utilization of sensory information/sensory training in A. 1-5 above.

C. Rate/Content/Sequence/Prerequisites
    1. Area of geographical considerations
    2. Population considerations

D. Choosing teaching areas/times

E. Instructor position during instruction/lessons

F. Corner location at "T", offset, complex intersections, curved streets.

SECTION 7 TRANSPORTATION

I. Automobile Travel

- A. Objectives: To enable the blind person to safely and efficiently enter and exit automobiles and remain oriented enroute.

- B. Familiarization to Automobile
  1. For procedure, refer Section 9.
  2. Exterior reference points/relationships
     - a. Side view mirror's - reflective surface always faces backwards and is standard on driver's side of the auto.
     - b. Windshield wipers usually found only on front window.
     - c. Round glass headlights are found in front of auto.
     - d. Bumpers found on front and rear of auto and tires on both sides.
     - e. Tail lights found in rear of the auto, are usually plastic and vary in shape.
     - f. Vertical glass surfaces usually found only on sides of autos.
     - g. Door posts, handles, latches, buttons, etc. found on the opposite side of the doors from the hinges.
     - h. Doors usually swing open towards the front.
     - i. Engines located in front of most American autos, rear of most foreign autos.
     - j. Grillwork usually found only in front of autos.
  3. Interior reference points/relationships
     - a. Seats face forward.
     - b. Dashboard (instrument board), rear view mirror, steering wheel, directional signal, shifting lever found in front of auto.
     - c. Window levers on doors or sides of autos.
     - d. Seat adjustment levers vary in position.
     - e. Radio, glove compartment found in front of auto.

- C. Entering Procedure
  1. Locate the door handle utilizing the available reference points and appropriate cane techniques.
  2. Clear the area over which door will open.
  3. Open the door with the most convenient hand, maintaining contact with the upper corner of the door as it opens to prevent being hit by it.
  4. While opening the door, hold the cane in the most convenient hand.
  5. Once the door is open, hold the cane vertically in the hand nearest the door and prevent the door from closing.
  6. Use the free hand in a modified upper protective technique to locate the roof edge at the top of the door opening.
  7. Duck the head into the door opening, then release free hand from roof edge and use it to clear the seat inside.
  8. Seating - Front seats or Back seats of a Four Door Auto
     - a. Stepping in first

        - (1) Keeping the head inside the car, use the free hand to locate the dashboard or back of the front seat for balance and as a reference point.
        - (2) Step into the auto with the foot that corresponds to the free hand.
        - (3) Turn the body and sit in the seat bringing in the foot nearest the door.
        - (4) Bring the cane into the car last, keeping one hand on the crook while placing the tip on the floor board near the door. The cane should never extend or be stored toward the driver's side when the blind person is sitting in the front seat.
        - (5) Use the hand nearest the door to close it.
        - (6) Fasten your seatbelt.
    - b. Sitting First
        - (1) Use the free hand to relocate the roof edge above the door opening and remove the head from inside.
        - (2) Turn around, facing away from the opening while maintaining control of the door and contact with roof edge.
        - (3) Sit back onto the seat using the roof edge for support.
        - (4) Swing the legs into the auto while turning towards the front.
        - (5) Repeat step I. c. 8.a. (4).-(6). above.
- 9. Seating - Back Seat of a Two-Door Auto
    - a. Repeat steps I.c.1-6 above.
    - b. Then duck the head into the opening, releasing the free hand from the door edge to locate and move the upright portion of the front seat forward and out of the way.
    - c. With the foot that corresponds to the free hand, step into the back seat area, bending at the waist to avoid contacting the interior roof with the head.
    - d. Clear the seat with the free hand.
    - e. While bringing the other foot into the car, turn the body and sit down.
    - f. Bring the cane in last, storing it with the tip near the door but not interfering with passengers in the front seat.

D. Orientation Enroute

1. The blind person should learn a route frequently traveled by automobile so that he may assist any future drivers who may be unfamiliar with the route.
2. The blind person should learn the route in terms of sensory information available to him such as direction and quantity of turns, hills, bumps, auditory landmarks, etc.
3. He should also learn the route in terms that will assist the driver unfamiliar with the route. This information would take the form of direction of travel, direction of turns, names of streets traveled upon, names or number of interesting streets and description and location of visual landmarks. This information will be gleaned from drivers familiar with the route.

E. Exiting Procedure
- 1. Front Seat or Back Seat of a Four Door Auto
  - a. Open the door and place the cane outside the auto, clearing the area.
  - b. Swing the legs out of the auto and use free hand to locate the roof edge at the top of the door opening.
  - c. Control the door with the cane in the hand nearest the door.
  - d. Step out of the auto and move back from the door area.
  - e. Close the door; be certain that everyone is clear of the door.
  - f. Keep the cane in the most convenient hand.
- 2. Back Seat of a Two-Door Auto
  - a. Use the free hand to push the upright portion of the front seat forward and out of the way.
  - b. Place the cane tip outside the auto, clearing the area.
  - c. Use the free hand to locate the roof edge above the door opening.
  - d. Move the head outside the door and step out, one foot at a time or move the body laterally out of the auto.
  - e. Repeat steps I.E. 1. d-f. above.

F. Discussion Topics - Automobile Travel
- 1. Role of spatial orientation to automobile travel.
- 2. Adaptations/modifications of entering/exiting procedures
  - a. Station wagon back seats
  - b. Vans
  - c. Sports cars
  - d. Trucks
- 3. Rate/Content/Sequence/Prerequisites
  - a. Area of geographical considerations
  - b. Populations/needs/considerations.
- 4. Utilizing sensory information/sensory training.
- 5. Distinguishing between American and foreign cars auditorily.
- 6. Lessons designed to test orientation enroute.
- 7. Utilization of driving time to and from lessons.
- 8. Choosing teaching areas/vehicles/times.

II. Taxi Travel

A. Objectives: To enable the blind person to safely and efficiently utilize taxis for transportation.

B. Telephoning for Taxi
- 1. From home or office, telephoning for a taxi is the easiest means to get a taxi at the time and place needed.
- 2. If a trip is to commute regularly, arrangements can be made accordingly with the company.
- 3. Rates and approximate fares can be determined in advance of a trip.
- 4. The location of taxi stands can be determined.

C. Locating Taxi Stand/Hailing Taxi
  1. At most transportation terminals, large hotels, fashionable theaters, etc. taxi stands are located in front of or near a main entrance.
  2. In these same places, porters, doormen or ushers may be called upon to assist in locating a taxi.
  3. Pedestrians can be of assistance in hailing a taxi on the street when no taxi stand can be located,
  4. Get identifying information from dispatcher.

D. Entering Taxi
(refer I.C. 1-8 p. 74.)

E. Communications With Drive
  1. Describe desired destination and discuss approximate fare.
  2. Intimation of a knowledge of the route and the fare may produce more equitable charges.
  3. Upon exiting, ask the driver where you are located relative to the entrance of your destination.

F. Orientation Enroute
  1. Refer I.D. 1-3 p. 75.
  2. Knowledge of the route may assist drivers who may not be familiar with the area or location of your destination.
  3. Knowledge of the route may insure that the most direct route is taken.

G. Exiting Taxi
(refer I.E. 1. p. 76.)

H. Discussion Topics - Taxi Travel
  1. Refer I.F. above (Concurrent Items Automobile Travel)
  2. Taxis for instructional usage.
  3. Informing drivers of proper sighted guide technique.
  4. Limousine service.

III. Bus/Trolley Travel

A. Objectives: To enable the blind person to safely and efficiently utilize, these forms of public transportation.

B. Familiarization
  1. For procedure, refer Section 9.
  2. Exterior reference points/relationships
    a. Usually two doors, on the side opposite the driver/conductor.
    b. The forward door is usually just forward of the front wheel and just backward from the front bumper.
    c. Bumper and windshield wipers are located in front.
    d. Engine is in the rear of the bus.
    e. Round glass headlights in the front, various shaped plastic tail lights in the rear.

        - f. Doors labeled front/back relative to direction of travel.
    - 3. Interior reference points/relationships
        - a. Driver, fare box, bench, seats, parallel to direction of travel are usually located in the front and sometimes in the middle.
        - b. Theatre seats usually extend to the rear of the car, ending with wide bench seat across the back of the car.
        - c. Two doors on opposite side from driver, one door on driver side.
        - d. Poles, overhead railings, handles on seats are located in various places.
        - e. Call-bell rope located near top (above window) on each side.
        - f. Ventilation fans on ceiling.

C. Locating Stops
  1. Determine any pattern to location of stops:
     - a. Before/after intersections
     - b. Mid-block
     - c. Middle of divided street
     - d. Major/minor intersections
  2. Locate landmarks such as poles, benches, or shelters.
  3. Locate pedestrians waiting for buses.
  4. Call transportation company.

D. Identifying/Hailing Vehicles
  1. Cues to Approach
     - a. Metal wheels on trolley tracks.
     - b. Distinctive engine sound in rear of bus.
     - c. Air brakes, tire sounds, transmissions sounds.
     - d. Pedestrians moving toward curb/tracks.
     - e. Doors opening.
  2. Request pedestrian for identification assistance.
  3. If the trolley or bus does not stop at every stop keep the cane held in view for the drivers. Face the approaching vehicle and raise a hand to hail it.

E. Locating Doors
  1. Listen for doors opening and any other pedestrians boarding.
  2. If the bus has stoppend away from the curb, clear and step down into the street and use touch technique to locate the bus.
  3. Travel towards the front of the vehicle using a two-point touch technique with the shaft in contact with the side of the vehicle or in combination with hand trailing.
  4. The front door should be located by utilizing the exterior reference points listed in II. B.2. above.
  5. If the identity of the bus/trolley is unknown, ask a fellow pedestrian or the driver before boarding.

F. Boarding Vehicle
  1. Locate the hand rail inside the bus and utilize it while negotiating steps. Use the other hand to apply the modified diagonal cane.

2. Follow the hand rail to the fare box or to its termination near the driver.
3. Deposit coins if necessary and if fare is known.
4. Always maintain contact with the hand rail for balance.

G. Communications with Drive
1. While at the fare box, ask the driver to stop at your desired destination or inquire as to the stop closest to your desired destination. If fare is unknown, ask driver at this time.
2. Request the driver to notify you when your stop is being approached or has been reached.
3. Ask for the location of a seat near the door or behind the driver.

H. Negotiating Interior
1. Use a congested area or diagonal cane technique.
2. Always maintain contact with a handrail, pole or grasp handle on the seats.
3. Check for an empty seat by sliding the cane shaft laterally across the front edge of the seat. Implement this procedure only if absolutely necessary.
4. Store cane vertically.

I. Orientation Enroute
1. The blind person should maintain awareness of the location of the vehicle enroute to guard against passing his desired stop should the driver forget his presence.
2. Utilizing available sensory information, the blind person should maintain an awareness of the number and direction of turns, number and relative location of gradients, number of stops (if a pre-determined number), volume of passenger entry/exit, auditory, visual and cutaneous landmarks and combinations of these factors.

J. Exiting Vehicle
1. Use a congested area or diagonal cane technique with tip in contact with the floor to locate the stairwell at the doors.
2. When moving, maintain contact with a handrail, pole or grasp handle on the seats.
3. Use the handrail and the diagonal cane while descending the steps.
4. Clear the walking surface for obstructions and/or locate the curb edge.
5. If the bus has stopped in the street away from the curb, travel directly to the curb edge, clear and step up.

K. Discussion Topics - Bus/Trolley Travel
1. Role of spatial orientation to bus/trolley travel.
2. Rate/Content/Sequence/Prerequisites
    a. Area or geographical considerations.
    b. Population considerations.
3. Utilizing sensory information/sensory training.
4. Choosing teaching area/times.

5. Instructor positions during instruction/lessons.
6. Role playing by instructor.
7. Introduction to bus travel.
    a. Inbound/outbound
    b. Zones/fares
    c. Transfers
    d. Routes/route number and names
    e. Overlapping routes/overlapping stops
    f. Feeder lines
    g. Availability of maps
8. Types of familiarization depending upon traveler need.

IV. Subway Travel

A. Objectives: To enable the blind person to safely and efficiently utilize this form of public transportation.

B. Familiarization to Station
1. For procedure, refer Section 9
2. Exterior Reference Points/Relationships
    a. Location of stairs relative to parallel/perpendicular streets.
    b. Location of stairs relative to landmarks and/or bus stops.
    c. Number and direction of stairs (enter/exit)
    d. Location of stairs relative to sidewalks/curbs.
3. Interior Reference Points/Relationships
    a. Location of stairs relative to fare box, turnstiles and information booth
    b. Location of fare box, turnstiles, and information booth relative to platform
    c. Location of benches, poles, and other landmarks.
    d. Level of tracks in relation to platforms
    e. Location of appropriate waiting areas

C. Familiarization to Subway Vehicles
1. For procedure refer Section 9.
2. Exterior Reference Points/Relationships.
    a. Number and relative location of doors.
    b. Gates or openings between vehicles.
    c. Location of conductor/door man and the direction he faces.
3. Interior Reference Points/Relationships
    a. Number and relative location of doors.
    b. Location, facing direction and type of seats.
    c. Location of handrails, poles, dividers, overhead hand grips, etc.
    d. Location of desirable standing areas in crowded vehicles.

D. Locating Station
1. A telephone call to the transportation company should produce information concerning area and/or street location.
2. Pedestrians descending or ascending stairs may reveal the location of the entrance.

3. At times, wind, heat or train sounds may be perceived emanating from the station.
4. Determine any pattern to location of subway entrances such as before or after intersections, mid-block, every tenth perpendicular street, etc.

E. Entering Station/Platform Area
   1. Whenever entering a subway station, try to use the entrance stairs and always use the handrail.
   2. At the base of the stairs utilize auditory information to locate fare box, turnstiles or information booth. Pedestrians sounds are especially useful.
   3. Enter platform area and approach the platform edge using a touch and slide to locate the drop-off.
   4. Having located the drop-off, back away from it to allow clearance for vehicles.
   5. Position cane vertically in front of the body.

F. Identifying Approach of Vehicles
   1. The approach and stop of the vehicles may be perceived auditorily and in some cases by the wind and vibrations they create.
   2. If there is more than one type or style of vehicle, this may be auditorily distinguishable during the approach, stoppings or door openings of the vehicles. If perceived, anticipations regarding exterior and interior reference points/relationships may arise and be utilized for safer, more efficient entry into vehicles.
   3. Wait until the vehicles are completely stopped before approaching them.

G. Boarding Vehicles
   1. After the vehicles stop, approach the edge of the platform using a touch and slide. Move in the direction of the doors.
   2. The location of the doors may be determined by their sound when opening, sounds of passengers boarding or exiting, sound from inside the vehicles or by using a modified two or three point touch technique against the car's exterior.
   3. If a choice of doors presents itself, travel towards the conductor/doorman.
   4. Locate the differential between the platform edge and the car floor to determine if a step-up or down is required.

H. Negotiating Interior
   1. Immediately upon entering, locate some stable means of support and maintain contact while searching for a seat if possible.
   2. Use a congested area or diagonal cane technique.
   3. Locate an empty seat by sliding the cane shaft laterally across the front edge of the seat.
   4. Store cane vertically.

I. Orientation Enroute
   1. Orientation enroute should be maintained to guard against missing the desired stop.

2. Some vehicles have loud speaker systems used to announce the stops.
3. Most subways have a pre-determined number of stops but additional stops are often made to pick up maintenance men, to avoid collisions during congested times of the day and to avoid collisions at points along the route where tracks cross each other.
4. Sources of sensory information include turns, gradients, movements from below to above ground, doors opening and closing, passengers boarding.

J. Exiting Vehicle
   1. Prepare to disembark before the vehicle stops if you are a distance from the door.
   2. Use a congested area or diagonal cane technique.
   3. Locate the differential between the vehicle and the platform edge to determine if a step up or down is needed.
   4. Clear the platform area and step onto the platform.

K. Exiting Station
   1. The exit to the station may be located by noting, the travel direction of passengers disembarking from the vehicles.
   2. In the absence of other passengers, locate the turnstiles or information booth by available sensory information.
   3. The stairs leading to the street may be perceived by street sounds coming down stairwells from above.

L. Discussion Topics - Subway Travel
   1. Role of spatial orientation to subway travel.
   2. Rate/Content/Sequence/Prerequisites.
      a. Area or geographical considerations.
      b. Population considerations.
   3. Utilizing sensory information/sensory training.
   4. Choosing teaching area/times.
   5. Instructor positions during lessons.
   6. Introduction to subway travel
      a. Inbound/outbound
      b. Zones/fares
      c. Routes/route numbers and names
      d. Overlapping routes/overlapping stops
   7. Types of familiarization depending on traveler need.

V. Discussion Topics - Transportation Terminals (Air, Train, Long Distance, Bus)
   1. Role of spatial orientation.
   2. Utilization of sensory information/sensory training.
   3. Travel techniques.
   4. Sources of assistance/use.
   5. Types of familiarization depending upon traveler need.
   6. Interior reference points/relationships - terminals and vehicles.
   7. Instructor positions during instruction/lessons.
   8. Choosing teaching areas/times.

9. Rate/Content/Sequence/Prerequisites
    a. Area or geographical considerations
    b. Population considerations.

SECTION 8

Special Travel Situations

I. Gas Stations
  - A. Objectives: To enable a blind person to identify and travel past or recover from entry into gas stations.
  - B. Familiarization
    1. For procedure, refer Section 9
    2. Reference Points/Relationships
       - a. Gas stations are usually located at or near intersections.
       - b. Pumps are located on islands between the building and the street.
       - c. Pressure sensitive hoses connected to service bells usually lie perpendicular to streets and islands (service islands).
       - d. Islands are usually parallel to the nearest street.
       - e. Wide driveways usually lead to each street bordering the gas stations.
       - f. Driveways always cross the sidewalks, often creating a gradient across them.
  - C. Identification
    1. Auditory Information Sources
       - a. Automobiles entering/exiting or starting/idling in the station.
       - b. Service bell ringing, operation and utilization of tools, operation of gas pumps and air hoses, conversations.
       - c. Change in auditory information caused by break in the building line ("open space")
    2. Proprioceptive Information Sources
       - a. Gradients caused by driveways crossing sidewalks.
       - b. Expansion joints between surface materials.
    3. Haptic Information Sources
       - a. Cane contact with differentiated textures and expansion joints.
       - b. Cane contact with service bell hoses, islands, automobiles, buildings, advertising signs.
    4. Olfactory Information Sources
       The primary sources of olfactory information are petroleum products.
    5. Cutaneous Information Sources
       The primary sources of cutaneous information are changes in wind or illumination.
  - D. Procedures for Passing
    1. Primary
       - a. Maintenance of a straight line of travel should ensure avoidance of entrance into gas stations provided the traveler is appropriately positioned on the sidewalk.
       - b. Direction taking from traffic, primarily parallel, will assist in avoidance of entrance into gas stations.

2. Secondary
   a. Direction taking from gradients (if present) caused by driveways crossing sidewalks may be utilized for crossing the station.
   b. Utilizing a touch and drag technique to follow the expansion joint between the sidewalk and the gas station surface is possible in stations where the expansion joint is pronounced enough to be perceived.

E. Recovery after Entry
1. Course Monitoring. Utilization of available sensory information (refer I.C. above) will allow for the recognition of entry into the gas station.
2. Recovery Procedure
   a. Turn towards the nearest traffic and move perpendicularly towards it, if possible.
   b. Available sensory information will allow for judgements of position relative to sidewalk and street while moving towards the nearest traffic.
   c. Upon relocation on sidewalk, utilize available sensory information to re-establish a line of travel.

II. Parking Lots

A. Objectives: To enable a blind person to identify and travel past or recover from entry into parking lots.

B. Familiarization
1. For precedure, refer section 9.
2. Reference Points/Relationships
   a. Driveways usually lead to each street bordering the lot.
   b. Driveways always cross the sidewalks, often creating a gradient across them.
   c. Cars in parking lots are usually parked in rows with aisles between the rows.
   d. Rows on the perimeter of a parking lot are usually bordered on one end by curbing, walls, fences or tire stops.

C. Identification
1. Auditory Information Sources
   a. Automobiles entering/exiting or idling/starting in the lot.
   b. Trucks unloading at businesses adjacent to the lot.
   c. Pedestrians walking in the lot.
   d. Sound sources in buildings/businesses adjacent to the lot.
   e. Change in auditory information caused by break in the building line ("open space").
2. Proprioceptive Information Sources. (refer I.c.2. above)
3. Haptic Information Sources
   a. Cane contact with differentiated textures and expansion joints.

        - b. Cane contact with automobiles, tire stops, buildings, border fencing.
    - 4. Thermal Information Sources.
      The primary sources of cutaneous information are changes in wind or illumination.

- D. Procedures for Passing
  (refer I.D. above)

- E. Recovery after Entry
    - 1. Refer I.E. above
    - 2. Because of the border on many parking lots, access to the nearest traffic is obstructed. If blocked from traffic, travel toward vehicles entering/exiting the lot.
    - 3. If auditory information is unavailable, attempt to locate the entrance by retracing the entry route.

III. Railroad Crossings

- A. Objectives: To enable a blind person to identify and safely cross railroad tracks.

- B. Familiarization
    - 1. For procedure, refer Section 9.
    - 2. Reference Points/Relationships
        - a. Tracks are paired and parallel to each other.
        - b. Tracks are most often perpendicular to the streets that they cross.
        - c. There are usually gradients leading to railroad tracks.
        - d. Warning systems are usually very close to the tracks.

- C. Identification
    - 1. Auditory Information Sources
        - a. Train approach warning bells.
        - b. Vehicles slowing to cross the tracks.
        - c. Vehicle tires contacting the tracks.
        - d. Train whistles and engines, and wheels on tracks as it approaches.
    - 2. Proprioceptive Information Sources
        - a. Gradient leading to the tracks at most crossings.
        - b. Gaps in surface material adjacent to each track.
    - 3. Haptic Information Sources
        - a. Cane contact with the tracks and warning gates.
        - b. Cane contact with differentiated textures and expansion joints.

- D. Procedures for Crossing Railroad Tracks
    - 1. Crossings with Sidewalks
        - a. Maintain approach line of travel
        - b. Utilize parallel traffic for direction taking.
        - c. Utilizing a touch and drag, follow the guideline created by the drop-off at the sidewalk edge away from the parallel street.

2. Crossings without Sidewalks
   a. Utilize a touch and drag to follow the guideline created by the drop-off of the street pavement at the crossing.
   b. If travel in the street while following this guideline is too dangerous because of the speed, volume or proximity of the traffic, follow the same guideline while traveling out of the street.

E. Procedures with Train Approaching
   1. If the train approaches before beginning to cross, stop at a landmark or move away from the tracks and wait for the train to pass.
   2. If the train approaches after beginning to cross, judgement of the distance and approach speed of the train and the distance remaining to cross will determine the course of action:
      a. If sufficient time remains to complete the crossing safely, do so.
      b. If sufficient time does not remain to complete the crossing, return to a landmark or move away from the tracks.
   3. If disoriented, take a perpendicular direction from the sounds of the approaching train and the tracks and move away from the tracks.

IV. Discussion Topics - Gas Stations, Parking Lots and Railroad Crossings
   A. Modifications of Techniques/Procedures.
      1. Gas stations
      2. Parking lots
      3. Railroad crossings
   B. Role of spatial orientation in A. 1-3 above.
   C. Utilization of sensory information/sensory training (A. 1-3 above)
   D. Rate/Content/Sequence/Prerequisites.
   E. Choosing Teaching Areas/Times.
   F. Instructor positions during instruction/lessons.

V. Soliciting Sighted Assistance
   A. Objectives: To enable a blind person to receive the information or the physical assistance desired.

   B. Degrees of Assistance
      1. The amount and kind of assistance solicited should be determined by the travel needs and the psychological needs of the blind person.
      2. The solicitation of verbal or descriptive assistance is often construed as less dependent than the solicitation of physical assistance.
      3. Environmental conditions frequently dictate that all blind traveler's receive physical assistance regardless of travel ability or needs.
      4. Degrees of assistance range from top level familiarization (verbal description) to sighted guide without description (totally dependent).

C. Procedures for Solicitation.

1. Choosing Sources.
    a. Wherever possible, choose the source of assistance that has had the most experience assisting people.
    b. Experienced sources indoors would include store clerks, security guards and service personnel at information booths.
    c. Experienced sources outdoors would include police officers, postal carriers, mass transit workers and vendors.
2. Locating Sources.
    a. Indoors, seek assistance from clerks by locating cash registers auditorily or by standing at a counter as if waiting for service or from a passerby.
    b. Outdoors.
        (1) Stand perpendicularly to pedestrian's movement for improved auditory perception of their approach from either direction and to display the cane.
        (2) More pedestrians are usually found at a corner than mid-block.
        (3) Proximity of destination from a corner must be considered when deciding to wait at a corner or away from it.
        (4) If the approximate location of the destination is known, it may be located with assistance from a nearby shopkeeper or homeowner.
3. Phrasing Questions
    a. The phasing of the request for assistance will often determine the degree of assistance offered.
    b. The following is a list of questions approximately sequenced according to the usual results (from verbal to physical and minimum to maximum assistance).
        (1) Verification - "This is Main Street, isn't it?"
        (2) Specific Yes - No - "Is this Main Street?"
        (3) Specific - "What street is this?"
        (4) Specific - "Is it this way?"
        (5) Open ended - "Where is it?"
        (6) Yes - No/dependent - "Is this Boston?"
        (7) Open-ended/dependent - "Where am I?"
    c. Generally, the public cannot be expected to verbalize well. Thus, specificity of questions along with pointing by the blind person will usually assist the sighted person to verbalize an answer.
    d. Generally, the public cannot be expected to know or use cardinal directions.

D. Controlling Physical Assistance.

1. The blind person should control the use of physical assistance by insisting on using proper sighted guide technique.
2. It is also advantageous to adhere to the following guidelines for using physical assistance.
    a. If possible, know where your ultimate destination is located.
    b. Make sure the sighted person knows where you want to go and where you destination is located.

c. Make sure that all crossings are at crosswalks or corners and are made during the proper traffic signal cycle.
d. Use a diagonal cane or touch technique to protect against poles, curbs, etc.
e. If feasible, mention your most immediate goal first, then extend your request for aid if you are confident in the sighted person.
f. Maintain awareness of direction and location while taking assistance.

VI. Locating Destinations

A. Objectives: To enable the blind person to locate destinations efficiently.

B. Destinations with Distinctive Landmarks.

1. Some destinations have characteristics which are distinctive enough to serve as landmarks.
2. Some examples include a store with the only deeply recessed opening on a block, a house with the only driveway causing a gradient across the sidewalk, etc.
3. To locate these destinations, locate the landmark.

C. Destinations without Distinctive Landmarks.

1. Many destinations do not have characteristics which stand out from the surroundings. They may be located using various procedures and techniques depending upon their location relative to their surroundings.
2. Procedures/Techniques
   a. End-of-the Block.
      (1) If the destination is at or near the end of the block, travel to the corner nearest the destination. Using the appropriate cane technique, travel towards the destination to locate it.
      (2) In some cases, the destination will be passed while going to the corner and then the travel direction reversed to locate it.
      (3) Examples of techniques and landmarks include:
         (a) Touch and drag to locate sidewalks and/or walkways;
         (b) Three point touch to locate steps or platforms;
         (c) Two point touch to locate breaks in a building line.
   b. Mid-block.
      (1) Destinations at mid-block may be located by establishing a landmark nearby which serves as the reference point to begin the search for the destination.
      (2) Examples of landmarks and methods of utilizing them include:
         (a) Traveling curb side, locate the second telephone pole. Move to the building line and locate the second break in the building line past the pole.

(b) Locate the second driveway past the elevated portion of the sidewalk (caused by tree roots).
(c) Traveling building line side, locate the planter which protrudes into the sidewalk. Locate the third break in the building line past the planter.

c. Catty-Cornered
(1) Many corner establishments have entrances which face diagonally into the intersection.
(2) To locate them while traveling on the sidewalk towards the corner, trail the building line near the corner.
(3) When standing at the corner, locate the entrance by one of the following procedures:
(a) Utilize sensory information and/or prior knowledge and make a judgement as to the location of the entrance.
(b) Move away from the corner and re-approach it, trailing the building line to locate the entrance.

VII. Vehicles Parked across Sidewalks

A. Objectives: To enable a blind person to safely circumvent vehicles obstructing the travel path.

B. Identification
1. When contact is made with the vehicle, check with the cane to determine the extent to which the vehicle blocks the travel path.
2. Utilizing the reference points/relationships listed in Section 7.I.B.2., determine the location of contact with the vehicle and the direction the vehicle is facing.

C. Factors Affecting Choice of Direction
1. A decision needs to be made as to traveling around the vehicle towards the street or away from the street.
2. Factors affecting this judgement include the hazards created by traveling in the street if the vehicle extends into the street and the hazard created by traveling behind an idling vehicle.

D. Procedure for Circumvention.
1. After deciding which direction to travel, trail the vehicle with the hand and/or the cane.
2. Trail the vehicle to a spot opposite the initial point of contact with the vehicle.
3. Turn towards the original line of travel, clear and proceed.

I. Familiarizations

A. Objectives

1. The prime objective of any familiarization for the blind traveler is to become familiar enough with an area or route to be able to travel safely and efficiently.
2. The instructor has two prime objectives: a. to familiarize the blind person to an area or route; and b. to teach the blind person a systematic procedure for becoming oriented to any area or route.

B. Types of Familiarizations

The types of familiarizations (area, route and rote course) are differentiated primarily by the individual's level of cognitive functioning and, to a certain extent, the degree of additional handicaps accompanying blindness. For example, area familiarization requires the greatest degree of conceptual understanding and abstraction ability while rote course travel requires the least. Area familiarization requires the highest degree of processing and utilization of sensory information with rote course travel requiring the least. The types are presented here in order from the most frequently used to least frequently used.

1. Area Familiarization provides orientation to any area, its components parts and the relationship of the component parts to the area and to each other.
   a. Populations: As a generalization, people who will utilize area familiarization procedures are characterized as follows:
      (1) Possess the ability to function on an abstract spatial orientation level (see Section 2);
      (2) Utilize an objective spatial orientation reference system (see Section 3);
      (3) Usually are not profoundly mentally retarded or emotionally disturbed;
      (4) Usually do not have an additional severe sensory handicap such as deafness.
   b. Characteristics of Traveler. As a generalization, people who will utilize area familiarization procedures possess the following abilities:
      (1) Can perform spatial problem solving within the area;
      (2) Can integrate and utilize new information about the area;
      (3) Can transfer spatial organization ability to new areas;
      (4) Can develop extensive knowledge of boundaries, object relationships and landmarks.
   c. Type of Travel. As a generalization, people who utilize area familiarization procedures will exhibit the following travel style:

        - (1) Will travel anywhere within the area and is not confined to known routes;
        - (2) Will plan and utilize alternate routes within an area;
        - (3) Will be only occasionally and temporarily disoriented if at all;
        - (4) Will be able to travel effectively in unfamiliar areas.

2. Route travel familiarization provides orientation to a route to be traveled, including the relationship of its parts to the whole route and the relationship of the route to its surrounding area (immediate or extended).
    - a. Populations. As a generalization, people who will utilize route travel familarization procedures are characterized as follows:
        - (1) Possess a functional spatial orientation reference system;
        - (2) Be able to process sensory information;
        - (3) Usually are not profoundly mentally retarded or emotionally disturbed;
        - (4) Usually do not have an additional severe sensory handicap such as deafness.
    - b. Characteristics of Traveler. As a generalization, people who will utilize route travel familiarization procedures possess the following abilities:
        - (1) Capable of solving spatial problems along the route;
        - (2) Can integrate and utilize new information about the route;
        - (3) Can transfer spatial organization ability to new routes;
        - (4) Can develop an understanding of the surroundings and the relationship of the route to its surroundings.
    - c. Type of Travel. As a generalization, people who will utilize route travel familiarization will exhibit the following travel style:
        - (1) Will plan and utilize alternate routes;
        - (2) Will develop new landmarks if the original ones are changed;
        - (3) Will usually experience only temporary disorientation if at all.

3. Rote Course Familiarization provides knowledge of a course to be traveled by sequential memorization of distances, landmarks indicating turns and the direction of turns, and landmarks for the destination.
    - a. Populations. As a generalization, people who will utilize rote course familiarization procedures are characterized as follows:
        - (1) Possess underdeveloped or functionally incomplete body image;
        - (2) Possess incomplete or inefficient perceptual-motor development;
        - (3) Possess impaired sensory abilities;
        - (4) Possess underdeveloped, incomplete or inefficient spatial orientation abilities.

Examples of such travelers are those who are labeled "profoundly retarded", "emotionally disturbed" or "deaf-blind."

b. Characteristics of Traveler. As a generalization, people who will utilize rote course familiarization procedures possess the following abilities:

  - (1) Be able to memorize a series of pieces of sensory information in sequence;
  - (2) Be able to respond appropriately to a stimulus in the environment;
  - (3) Be able to maintain attention to the task long enough to monitor the travel schema;
  - (4) Be unable to develop an understanding of the relationship between the parts of the route and the whole route and between the route and its surroundings.

c. Types of Travel. As a generalization, people who utilize rote course familiarization procedures will exhibit the following travel style:

  - (1) Will travel effectively when "on course";
  - (2) Will become disoriented if landmarks are removed or altered;
  - (3) Will have great difficulty becoming reoriented;
  - (4) Will not develop alternate routes

C. Learning Styles

The manner in which individuals learn most effectively and efficiently is determined by numerous factors. Listed below are several which seem to have major bearing on learning in Peripatology.

1. Mode preference. Individuals vary in their ability to utilize various forms of sensory input. Some people for example, can utilize a tactile map of a route for orientation but cannot effectively process the information contained in an auditory map (tape recording). In addition to ability many individuals simply prefer one sensory mode over another. As another example, some learn only through movement (by doing or traveling) whereas many individuals can learn through symbolic representations in graphic aids or conversations.
2. Processing/Retention ability. Individuals vary in the amounts of information they can effectively receive, process and retain at one time. Thus some people prefer the minimum amount of detail at a time with regard to a route or area.
3. Whole/Part learning. Individuals vary in their ability to perceive and conceptually understand the whole task, route, area, etc. As a result, some clients are confused by a whole complex route and learn best by learning the individual parts of the route in succession. Thus, the "Parts to Whole" learner integrates the whole after the parts are learned. On the otherhand, many people prefer an overview of the whole followed by mastery of the parts. This sequence facilitates the integration of the whole for the "Whole to Parts to Whole" learner.

D. Task Size and Complexity

In addition to accounting for learning style, the instructor must be aware of the need for alterations in presentation depending upon the size and complexity of the task.

1. Size. If, for example, an area is extremely large, the individual may learn the area best if it is divided into two or more sections each of which is presented in a manner appropriate for the clients learning style. Thus, teaching a large residential area in 4x4 block units may be the most effective manner for even a "Whole/Parts/Whole" learner.
2. Complexity. If an area (room or building for example) or a route has a complex spatial configuration, it may be divided into more easily comprehended parts. For example, an "H" shaped building may be taught as 2 parallel wings with a connecting piece in the middle. Thus a client can be familiarized to each part separately before they are integrated into a whole building. A complex route can be broken down into appropriate size and shape "links" and taught in sequence called "chains". Thus, a client may learn best by forward or backward chaining of information or steps.

E. Use of Orientation Aids

Numerous variables control the introduction and use of orientation aids. For example, mode preference will determine if the aid will be an auditory, visual or haptic map of an area. Client learning style will determine if the aid is a comprehensive overview of a route or merely depicts the first "link". For a more comprehensive treatment of the use of orientation aids, refer to the article "Guidelines for Construction and Use of Orientation Aids" in this manual.

F. Use of Sighted Assistance

For purposes of this manual, familiarization procedures are divided into two types according to the knowledge of the procedures and amount of assistance.

1. Assisted. This type of familiarization is actively conducted by a "professional", e.g., the peripatologist, rehabilitation teacher, etc. In this case, the blind person is being familiarized by someone who knows and utilizes the standard familiarization procedures.
2. Unassisted. This type of familiarization is actively conducted by the blind person who may choose to utilize available sighted assistance during the procedure. For example, an individual may seek the assistance of friends, neighbors, bell hops, etc. who will need to be directed as to how to be most effective. This type also includes the cases where the blind person familiarizes himself without any assistance.

G. External Variables and Constraints

While it may be the natural tendency of each instructor to maxmize the client's knowledge of a route or area, there are various factors which may necessitate conducting familiarizations on a level lower than the client's ability. Two such factors are time and need.

1. Time contraints often determine the type of familiarization conducted. It is not an uncommon experience to be restricted to a few hours of instruction in order to meet a client's travel need. For example, an instructor may have only 3 hours in which to familiarize a client from home to work and return. The client may be capable of learning by route procedures (learn relationships to surroundings, plan and execute alternate routes, etc.) but the instructor may wisely make a "no-frills" rote course presentation in order to achieve the primary objective.
2. Need contraints are also common determinants of the type of presentation the instructor makes. For example, an instructor may be called upon to familiarize a student to a campus. The student may be capable of learning the whole campus and all of its buildings but if the student's needs are met by selected routes then the presentation may be of the route familiarization variety. Thus instruction within a building may be restricted to routes to and from the door and the classroom and to and from the restroom and classroom.

Several points need to be made with regard to the material just presented. First, because there are infinite combinations of environments and learning styles, there will necessarily be more than three types of familiarizations. A variety of hybrid forms may be most appropriate for your clients. Second, using labels ("retarded", "emotionally disturbed", etc.) to determine the type of familiarization is not a good practice. In the preceeding, those labels were used while presenting generalizations. Since you teach specific individuals, let the individual not the "label" determine the type of presentation. Third, the material presented is merely an outline. Additional coursework, lectures, readings and experience will provide the reader with functional understanding of the factors highlighted.

The procedures as listed below are in sequential order from the most complex to the least and also in order of the frequency of presentation by most instructors. It should be noted that each set of procedures will be modified by various degrees by the factors listed above (learning style, degree of spatial orientation, needs, etc.)

H. Assisted Area Familiarization Procedures

The prime objectives of this set of procedures is to familiarize the blind client to an area such as a dorm room, classroom or place of employment and to teach the client the logic and sequence of the procedures for future, systematic unassisted familiarizations.

1. Introduction
2. Establish homebase
3. Establish orientation/reference system
4. Introduce Orientation Aid
5. Determine Dimensions and Shape
6. Verbalizing/Pointing from Homebase
7. Unassisted Walk Through the Area
8. Object Location and Identification

9. Establish Object to Object Relationships
10. Unassisted Walk Through the Area
11. Change Homebase

1. Introduction/Discussion
   It is appropriate to begin to describing the purpose of the familiarization, the purpose or use of the room (lecture hall, etc.), and to provide some information as to what the blind person might expect to find in the room. It should be noted that some people appreciate a large amount of descriptive information (height of ceiling, type of lighting, etc.) at this time in order to help them "get a picture of the room". As might be expected, others prefer a minimum amount of descriptive information.
2. Establish Homebase
   a. The homebase should be easily recognizable from its surroundings, for example, a very distinctive street corner in a residential neighborhood.
   b. The homebase should be appropriate for the area being used. For example, the most logical first homebase in most rooms is the door through which the blind person will enter the room.
   c. The homebase should be safe and secure. In heavily traveled areas, a homebase near the door is safer and less disruptive than utilizing (and blocking) the door itself.
3. Establish Orientation/Reference System
   a. The system should be functional for the blind person.
   b. Apply the reference system to the area, labeling walls, streets, etc. according to the system.
   c. Align the blind person with the homebase and reference system.
4. Introduce Orientation Aid
   a. An orientation aid may be introduced at this time to facilitate the familiarization. Refer to "Guidelines for the Construction and Use of Orientation Aids" in this manual for a more comprehensive treatment.
   b. Align the aid with the environment and apply the reference system to the aid.
   c. Utilize the aid at this time to introduce the dimensions and shape of the area.
5. Determine Dimensions and Shape
   a. Describe the dimensions and shape in terms understood by the blind person and in terms of the reference system.
      (1) Have the blind person point to the boundaries, corners, etc. while you describe them.
      (2) If an aid is being used, have the blind person locate the boundaries, corners, etc. on the aid and point to them in the environment while you describe them.
   b. Walk through the area to determine the dimensions and shape.
      (1) Utilizing sighted guide technique allows the blind person to attend to the perceptual aspects without

concern for safety during the first trip through the area.

(2) Traveling unguided on subsequent trips allows the blind person to make time distance judgements of the dimensions. It also allows for checking, adjusting and reinforcing perceptions from the sighted guide trip.

(3) There are two common patterns of travel from homebase.

(a) If the periphery of the area is open or relatively open, walk one linear direction and reverse to learn one dimension. Then walk the second linear direction and reverse to learn the second dimension and assist in the approximation of the size and shape of the area. Then walk the periphery of the area to learn or confirm and reinforce the size and shape of the area.

(b) If the periphery of the area is cluttered or closed, repeat the sequence listed in (a) above but travel in the open area to determine the size and shape of the area that is available to travel through.

(4) As an aid to developing orientation to the area, place sound source at homebase (e.g., a radio or your voice) so that the blind person may relate the boundaries, corners, etc. to homebase as they are located. Ask the blind person to point to homebase each time a boundary, corner, landmark, is located. (This procedure will only work in areas of limited size)

6. Verbalizing/Pointing from Homebase
   a. After returning to homebase, ask the blind person to describe the area in terms of distance, shape, names of boundary streets, walls, corridors, etc.
   b. Have the blind person point to the corners and boundaries and/or to the important locales/objects within the area. This will serve as a test of spatial orientation and an aid to the development of it. If an aid is being used, have the blind person locate the relevant symbols on the aid while pointing to them in the environment.
   c. Should the blind person experience difficulty in pointing to boundaries, corners, etc., the instructor may walk to them, talk with the blind person and have the blind person point to where the instructor is standing.
7. Unassisted Walk Through the Area
   a. If warranted, the instructor may ask the blind person to walk through the area again.
   b. This will serve to correct misperceptions or to confirm and reinforce learning from the previous steps.
   c. Errors should be controlled at this point.
8. Object location and Identification
   a. Explore the area for the purpose of locating sources of sensory information and identifying objects and landmarks.

   - b. Relate the location of these sources and objects to the homebase (near, mid, far; center, periphery).
   - c. As an aid to establishing the relationship of various objects and landmarks to homebase, have the blind person walk from the object or landmark directly to homebase (if possible) and then attempt to return directly to the object. If an orientation aid is being used, utilize it in conjunction with travel to relate objects located to homebase and homebase to objects. Utilize a sound source to facilitate this procedure.
   - d. Make note of the consistent relationships as well as the temporary or inconsistent relationships.

9. Establish Object to Object Relationships
   - a. Determine the relationship of sensory sources, objects and landmarks to each other by traveling from one to another and returning.
   - b. If an orientation aid is being utilized, locating objects and determining their relationships on the aid should be done in conjunction with travel.
   - c. A sound source may be utilized to facilitate this procedure by placing the source at one then the other object as the blind person travels to the from them.

10. Unassisted Walk Through the Area

    The purpose of this step is for the blind person to:
   - a. Test established relationships and spatial orientation;
   - b. Apply established relationships and spatial orientation to travel;
   - c. And reinforce established relationships and spatial orientation through repeated observations;
   - d. The instructor should allow the client to make errors and self correct if possible. This will allow the instructor to evaluate orientation to the area and to evaluated the client's problem solving ability.

11. Change Homebase
   - a. After establishing spatial orientation to the area from one homebase, change homebases to provide a different perspective on the area.
   - b. Change to the next most appropriate reference point in the area. For example, if the door into a classroom was the first homebase, the child's assigned seat would be a logical second homebase. The entrance to a building might be an appropriate initial homebase with the door from the blind person's office being a logical second homebase.
   - c. Repeat the first 10 steps of the procedure above as needed.
   - d. Learning from the first homebase should transfer readily and facilitate learning from the second. It might be expected that developing spatial orientation from the second homebase may be mush faster from the first homebase and that some steps in the procedure are completed very quickly.

I. UNASSISTED AREA FAMILIARIZATION PROCEDURES (SELF-FAMILIARIZATION)

The objective of this set of procedures is for the blind person to become oriented to a desired area utilizing a logical, sequential set of steps. The blind person may choose to utilize sighted assistance.

It should be noted that the procedure for a self-familiarization is basically the same as one conducted by the instructor. The main difference is that the blind person does it completely alone or directs a sighted person in his assistance. Because of the similarities, the discussion that follows will cover primarily the adaptations from the assisted procedure which are necessary and which facilitate the process.

1. Introduction
    a. When utilizing a sighted assistant, the blind person should describe the procedure and the assistant's role.
    b. The blind person should solicit any information desired about the area including locating floor plans of buildings, street maps, etc.
2. Establish Homebase
    a. If alone, the blind person should choose a homebase utilizing the guidelines previously discussed and then thoroughly explore the area around it. This exploration will aid in relocating the homebase after leaving it.
    b. The blind person may leave a sensory source at homebase to aid in its location. For example, a radio left at the door of a room or on the front porch of a house will make the homebase easy to locate.
3. Establish Orientation/Reference System
    a. Without assistance, the blind person should choose the reference system most suitable to him.
    b. When utilizing assistance, a mutually suitable system should be agreed upon.
    c. In some instances the blind person may choose to teach the assistant an appropriate system. For example, in becoming familiar with a new city, the use of cardinal directions is very useful since they are the foundation for the address system and the naming of some streets (e.g. South Main Street). In cases such as this, the sighted assistant can label a map with cardinal directions and learn how to apply the system.
4. Utilizing Orientation Aids
    a. If the blind person deems it useful and possible, he may direct the assistant in constructing an aid.
    b. The blind person should describe type, size, shape, colors, symbol sizes, etc.
    c. The aid may be then utilized in any of the prescribed manners that are appropriate to the team.
    d. Without assistance, the blind person may choose to construct an aid during or after the self-familiarization. A tape recorder aids in taking notes during the process to enhance the memory during construction of the aid.
5. Determine Dimensions and Shape
    a. If assistance is utilized, the assistant can describe the dimensions and shape in suitable terms, can direct

the use of the aid and assist in pointing to boundaries, corners, etc.

   b. Using the assistant as a sighted guide helps during the initial exploration.
   c. The guide can describe the area and suitable patterns of search can be decided upon.
   d. If alone, the blind person will have to explore in a trial and error fashion to determine the best travel patterns.
   e. In either cases, use of a sound or other sensory source at homebase aids the familiarization process.

6. Review From Homebase
   a. Utilizing the assistant, an aid or the tape recorder, the blind person should review what has been learned through exploration of the size and shape.
   b. With the assistant, the blind person should verbalize and point as in an assisted familiarization. However, without the assistant it should be noted that this type of talking to oneself and pointing into space is viewed as odd to say the least!

The remaining steps should be carried out as described in "Assisted Area Familiarization Procedures" with modifications along the lines of those listed in the first six steps.

J. ASSISTED ROUTE FAMILIARIZATION PROCEDURES

The prime objectives of this set of procedures is to familiarize the blind person to a route such as the route to and from work, to a specific classroom or from home to a shopping center and to teach the blind person the logic and sequence of the procedures for future, systematic unassisted familiarizations.

1. Introduction/Discussion
2. Establish Homebase
3. Establish Orientation/Reference System
4. Introduce Orientation Aid
5. Determine Dimensions and Shape
6. Verbalize/Point from Homebase
7. Unassisted Walk Through the Route (or segment)
8. Schema Development and Enrichment
9. Unassisted Walk Through the Route (or segment)
10. Change Homebase

1. Introduction/Discussion

   The instructor should describe the method of instruction to be used, (e.g. parts/whole, aids to be used, etc.) rationale for route choice preparations needed for the route (e.g., bus pass, subway money, etc.) and any peculiarities of the route or environs. The nature and amount of information appropriate at this time is dependent upon the client learning style and preferences.

2. Establish Homebase
   a. The homebase should be easily recognizable from its surroundings. The area around the homebase should be thoroughly investigated by the blind person in order to

    put it into context and to make it recognizable when returning.
  b. If possible, choose a realistic and logical homebase such as the bus stop that the client will utilize, the client's home, or the client's work space.
  c. If lessons are conducted in an area other than the area in which the client will travel upon completion of training, the instructor may "assign" a "home" to the client for subsequent lessons.

3. Establish Orientation/Reference System
   a. The system should be functional for the blind person.
   b. Apply the reference system to the route and its surroundings, labeling walls, corridors, streets, etc. according to the system.
   c. Align the system with the homebase.
   d. Align the blind person with the homebase and the reference system.
4. Introduce Orientation Aid
   a. An orientation aid may be introduced at this time to facilitate the familiarization. Refer to "Guidelines for the Construction and Use of Orientation Aids" in this manual for a more comprehensive treatment.
   b. Align the aid with the environment and apply the reference system to the aid.
   c. Utilize the aid at this time to introduce the dimensions and shape of the route.
5. Determine Dimensions and Shape
   a. Describe the approximate dimensions and shape of the route in terms understood by the blind person and in terms of the reference system. Depending upon the needs and ability of the blind person the route may be described in numerous ways including the following:
      (1) Cardinal Directions - "Travel North, then turn west."
      (2) Right/Left - "Turn right and travel 2 blocks and then turn left and travel 2 more."
      (3) Gradients - "You will be traveling downhill all but the last 2 blocks."
      (4) Position of the Sun - "The sun will be in your face for the first 3 blocks, then should be on your right after you turn."
      (5) Landmarks - "Make your turn just after the broken patch of sidewalk."
      (6) Position of Traffic - "The traffic will be on your right side for the whole trip."
      (7) Length of Blocks - "Travel 2 long blocks then turn and travel 3 shorter ones."
      (8) Downcurbs/Upcurbs - "Travel for 3 upcurbs and then turn and travel to the first downcurb."
      (9) Number of Crossings - "Make 3 street crossings and then locate the bus stop."
      (10) Combinations of the above and other descriptions may be utilized.
   b. If an aid is being utilized, the descriptions may be given concurrently with the blind person's exploration

and use of the aid. Have the blind person locate the boundaries, corners, etc. on the aid and point to them in the environment while you describe them.

c. Walk through the route (or segment of the route) to determine the dimensions and shape.
   (1) Utilizing sighted guide technique for the first trip allows the blind person to attend to the perceptual aspects without concern for safety or technique.
   (2) Traveling unguided on subsequent trips allows the blind person to make time-distance judgements of the dimensions. It also allows for checking, adjusting and reinforcing perceptions from the sighted guide trip.
   (3) The patterns of travel from homebase are largely determined by the length and complexity of the route and the learning style of the client:
      (a) A short and simple route may be covered as a whole if this is compatible with the client's learning style.
      (b) A long and/or complex route may be broken into segments. Routes may be divided into segments in numerous ways including: Intersecting streets; changes in travel direction; major landmarks; the start or finish of a public transportation segment of a route; intersecting sidewalks that lead to future destinations.
   (4) When routes are taught in segments, the instructor usually takes the blind person sighted guide back to the beginning of the segment. The return route is usually taught as a separate route after the entire first route is learned.

6. Verbalizing/Pointing from Homebase
   a. After returning to the homebase, have the blind person describe the route (or segment) in terms of shape, distances, names of boundary walls, streets or corridors, etc.
   b. Have the blind person point to the direction of travel. This will serve as a test of spatial orientation and as an aid to the development of it.
   c. If an aid is being used, have the blind person locate the relevant symbols on the aid while pointing to them in the environment.

7. Unassisted Walk Through the Route (or Segment)
   a. If warranted, the instructor may ask the blind person to walk through the route (or segment) again. Errors or veering should be controlled at this point.
   b. This will serve to correct misperceptions or to confirm and reinforce learning from the previous steps.

8. Schema Development and Enrichment

The initial trips along the route or segment should have restricted to showing what the travel path "should be like". This phase of the sequence is devoted to adding information to the "correct schema" and to give information regarding "off course" travel.

    a. The instructor should introduce more detail along the route at this time if it is necessary and useful to the blind person. This detail can include store names or offices passed along the route, relationships to the extended environment, address sytems, etc.
    b. The instructor should also introduce landmarks which tell the blind person that she has traveled too far, that she has veered into the street or that she has in general, veered away from the travel path. In terms of general schemata, the traveler needs to be aware of when she is "on course", "off course to the left", "off course to the right", and "has gone too far."
    c. If an aid is being used, this material should be presented in conjunction with it.

9. Unassisted Walk Through the Route (or Segment)
    a. With the more refined schema, the blind person should be better able to correct any mistakes and solve problems enroute.
    b. The instructor should allow the blind person to make errors or veer from the travel path if these instances occur. This will afford problem solving experiences and allow the instructor to evaluate the client's problem solving ability and to evaluate the adequacy of the schema.

10. Change Homebase
    a. A new homebase should be established when one of the following takes place:
        (1) A new segment is begun;
        (2) The route is reversed;
        (3) An alternate route is presented.
    b. The new homebase should serve as a link between the previously learned segment and the new one.
    c. Repeat the first nine steps of this procedure as needed.
    d. Some learning may transfer and facilitate learning of this phase. However, it should be noted that since a route is linear, there could also be confusion, especially between the initial route and its reverse.

K. UNASSISTED ROUTE FAMILIARIZATION PROCEDURES (SELF-FAMILIARIZATION)

The objective of this set of procedures is for the blind person to become oriented to a desired route utilizing a logical, sequential set of steps. The blind person may choose to utilize sighted assistance. As in the case of the area self-familiarization, the procedure is basically the same with regard to the steps and their sequence. The major differences lie in the initial preparation for the route familiarization and travel. The discussion that follows will concentrate on the adaptations from the assisted procedures which are necessary and will facilitate the process.

1. Information Gathering
    a. Before traveling a new route, the blind person can solicit information over the phone which will assist in travel. Examples include the following:
        (1) Address of the destination
        (2) Location of major intersection near the destination

        (3) Location of nearest bus line and stop (or subway)
        (4) Bus schedules
    b. Personal contact with family, friends, or neighbors can aid in choosing the best route, identifying the fastest form of public transportation, etc.
    c. Utilizing building floor plans, campus maps or city street maps can provide route information.

2. Utilizing Sighted Assistance
    a. If available, the blind person may choose to use a sighted person in route analysis in the environment.
    b. Using sighted guide or traveling in a car, various routes can be analyzed in advance of the familiarization. This can save time and prevent learning routes or segments of routes which will be altered or abandoned in the future.
    c. In this role, the sighted assistant can describe intersection configurations, traffic light cycles, location of "WALK" buttons, etc. With this information, the blind person can make decisions regarding the route to be traveled.
    d. If no sighted assistant is available for the entire route, the blind person may seek sighted assistance from various passersby enroute. (Refer "Soliciting Sighted Assistance", Section 8 of this manual).
    e. When no sighted assistance is available, the route analysis becomes a matter of trial and error.
3. Recording Information
    a. On long and complex routes, very large amounts of information can be gathered before and during the familiarization.
    b. It is often helpful to record this information in an appropriate form such as braille or large print notes or utilize a portable tape rocorder.

Procedure

1. Introduction
    a. When utilizing a sighted assistant the blind person should describe the procedure and the assistant's role.
    b. The blind person should request any information desired about the route.
2. Establishing Homebase
    a. The homebase should be chosen utilizing the guidelines previously discussed.
    b. The area around the homebase should be thoroughly explored so that the blind person will recognize it upon return. This is especially important if the blind person is alone.
    c. The blind person may leave a sensory source at the homebase to aid in locating it upon return.
3. Establish Orientation/Reference System
    a. If alone, the blind person will utilize the reference system most appropriate.
    b. When utilizing sighted assistance, a mutually suitable system should be agreed upon.

  c. In some instances, the blind person may choose to teach the assistant an appropriate system.

4. Utilizing Orientation Aids
  a. If the blind person deems it useful and possible, he may direct the assistant in constructing an aid.
  b. The blind person should describe type, size, shape, colors, symbol sizes, etc.
  c. The aid may be then utilized in any of the prescribed manners that are appropriate to the team.
  d. Without assistance, the blind person may choose to construct an aid during or after the self-familiarization. A tape recorder aids in taking notes during the process to enhance the memory during construction of the aid.
  e. Because routes are linear and sequential, a list of instructions may be more useful on note cards or tape.
5. Determine Dimensions and Shape
  a. If assistance is utilized, the assistant can describe the dimensions and shape in suitable terms (Refer "Assisted Route Familiarization Procedures"), can direct the use of the aid and assist in pointing to boundaries, corners, etc.
  b. Using the assistant as a sighted guide helps during the initial exploration.
  c. The guide can describe the route (or segment) and suitable patterns of search can be decided upon.
  d. If alone, the blind person will have to explore in a trial and error fashion to determine the best travel route or segments.
6. Review From Homebase
  a. Utilizing the assistant, an aid or the tape recorder, the blind person should review what has been learned through exploration of the size and shape.
  b. With the assistant, the blind person should verbalize and point as in an assisted familiarization.
7. Unassisted Walk Through the Route (or Segment)
  a. If the blind person chooses, he may walk through the route or segment to confirm and reinforce learning from the previous steps or to correct any misperceptions.
  b. If available, the assistant would help to control errors and veering at this time since only the basic schema is being concentrated upon (the "on course" schema).
8. Schema Development and Enrichment
  a. During this phase the blind person will add useful detail to the basic schema to assist in correcting errors or veers.
  b. If the assistant is available, details may be given that build on the basic schema and add "correction" information to it.
  c. The blind person will have to direct the assistant's provision of information necessary.
  d. If alone, the blind person may gather this information by seeking it directly or by learning as errors occur on subsequent trips.

9. Unassisted Walk Through the Route (or Segment)
    a. If an assistant is present, his role during this phase is to allow errors and veers and to assist the blind person only upon prearranged signal. This will foster independence and allow problem solving.
    b. If alone, the blind person may leave this step as a part of future independent trips or may utilize this opportunity for "practice".
10. Change Homebase
    a. The assistant's role is most helpful in choosing alternate routes, especially if the reversal of a route is not suitable.
    b. Repeat the first nine steps of this procedure as needed.

L. ROTE COURSE FAMILIARIZATION

The primary objective of this set of procedures is to orient the blind person to a desired route utilizing a logical, sequential set of steps. In general, the procedures for this type of familiarization are conceptually similar to those of the Assisted Route Familiarization Procedures. There are major differences, however, including the following:

1. There is no attempt to relate the course of travel to the surrounding environment;
2. The prime emphasis is placed upon the development of the "on course" schema and major instructional emphasis is placed upon staying "on course";
3. Errors and veering are very controlled initially as the use of this set of procedures implies diminished problem solving capacity;
4. Verbal instructions are usually kept at a minimum and more physical demonstration is utilized;
5. Performance criteria (vs. verbal) are the major measurement of learning;
6. Emphasis is placed on the rote memorization of the steps or segments;
7. The instructor chooses appropriate cues and landmarks and teaches the traveler to respond correctly to them in sequence;
8. The route taught is usually one which meets a frequent need such as travel to the dining room or to workshop;
9. The route is divided into segments or "links", each of which is distinguished at its beginning and end by a distinctive, concrete object;
10. Verbal cue words and physical cues or prompts are used with the environmental cues to produce the desired response to the environmental cue;
11. The "links" in the route may be chained forward or backward.

Procedure

1. Introduction/Discussion
2. Establish Homebase
3. Establish Orientation/Reference System
4. Introduce Orientation Aid
5. Determine Dimensions and Shape

6. Review from Homebase
7. Unassisted Walk Through the Route (or link)
8. Cues and Landmark Alteration
9. Unassisted Walk Through the Route (or link)
10. Change Homebase

1. Introduction/Discussion
   a. The instructor should ascertain what the blind person's needs and desires are and determine if they can be met through traveling.
   b. Motivation may be a factor and thus the "desirability" of the destination is very important.
   c. Goals, expectations and criteria for measuring successful performance should be discussed and agreed upon.
   d. The instructor should describe the procedures to be used, the rationale for the route and destination, and the preparations needed before beginning.
2. Establish Homebase
   In addition to the other factors involved in choosing a homebase, emphasis should be placed upon choosing a "realistic" one. The use of these procedures implies that teaching is not for transfer but to meet a specific need. Thus, lessons should be in the "normal" travel environment.
3. Establish Orientation/Reference System
   The usual systems associated with this type of familiarization are not abstract. They are usually egocentric which is satisfactory for this level of travel.
4. Introduce Orientation Aid
   It should be noted that aids are not as useful at this level because of the difficulties the clients encounter with the level of symbolization and the mechanics of using aids. Some clients, however, may benefit from an aid, especially a memory aid.
5. Determine Dimensions and Shape
   a. For many people at this level, the dimensions and shape are not useful information when given symbolically (verbally or with an aid).
   b. Descriptions such as left or right and short or long are more appropriate than more abstract descriptions.
   c. It is more appropriate to experience the dimensions and shape through movement utilizing first sighted guide, then independent travel.
   d. The route should be divided into "links" using some of the following guidelines:
      (1) Divide the route at changes in direction;
      (2) Divide the route at major sources of concrete sensory information such as intersecting corridors, ends of tables, streets, driveways, doorways, etc.
      (3) Divide the route at changes in techniques or procedures such as a point at which the client switches from touch technique to two-point touch technique.

   e. Change in direction and revesing the route constitute changes in homebase and signal the beginning of a new sequence of memorization.

6. Review from Homebase

   Even though primary emphasis should be placed on performance, a verbal review may be helpful to some clients. In any case, the blind person should be able to describe the destination and major streets and landmarks along the way for purposes of communication with the public.

7. Unassisted Walk Through the Route (or link)
   a. As with other types of familiarization, this step is necessary for reinforcement of learning and to foster independence. At this level, this step (as with previous steps) will be repeated several times or more.
   b. The instructor should carefully control errors and veering to enhance the development of the "on course" schema.

8. Cue and Landmark Alteration
   a. When first introduced, the links should always be comprised of constant sets of stimuli such as doors remaining closed and moveable furniture being consistently located in one spot.
   b. The instructor should begin to alter these cues and landmarks in the following sequence:
      (1) The client is shown which cue or landmark is to be altered and in what manner;
      (2) The client travels the link or route knowing which landmark or cue has been altered;
      (3) The client travels the link or route knowing that more than one such cue or landmark has been altered;
      (4) The client travels the link or route knowing that such cues or landmarks have been altered at random;
      (5) The sequence is repeated for each distinct type of cue of landmark.

9. Unassisted Walk Through the route (or link)
   a. Having learned the route under the various sets of stimuli conditions, the blind person should be capable of negotiating the route or link with normal, random alterations.
   b. The instructor should allow some errors and veering as a problem solving experience and an evaluation but should be careful to judge correctly the clients ability to self-correct.

10. Change Homebase
   a. The same guidelines for changing homebases apply here as in Assisted Route Familiarization Procedures.
   b. When routes are taught as links, each subsequent link, (e.g. link C to D) should be traveled in combination with the previous link (e.g. link B to C). This will put each new link into its proper perspective in the chain (e.g. A to B to C to D).

M. COMPONENTS OF ENVIRONMENTS TO BE LOCATED AND IDENTIFIED

1. Room
   - a. Furniture, ash trays, waste containers, appliances, doors, light switches, electrical outlets, windows, windowshades and/or curtains, closets, heating and/or cooling devices.
   - b. Specific sensory information sources and landmarks
2. Building
   - a. Include D.1. a-b above for rooms within buildings
   - b. Vestibules, lobbies, corridors, hallways, entrances, exits, fire escapes, stairs and elevators.
   - c. Offices, classrooms, general purpose rooms and areas, lavatories, chairs/stores.
   - d. Drinking fountains, telephones, vending machines, waste containers, ash trays.
   - e. Specific sensory information sources and landmarks.
3. Outdoor Area
   - a. Intersection configurations, traffic controls, crosswalks, landmarks for position on corner.
   - b. Stores, shops, bus stops, news stands, taxi stands, homes, public transportation stations, hazards, parks, mailboxes.
   - c. Specific sensory information sources and landmarks.

II. RE-ORIENTATION PROCEDURES

A. Objectives: To provide the blind person with a systematic means of re-establishing location and relationships after becoming disoriented.

B. Applications

1. This procedure may be applied in any travel environment and may be assured to be applied without extensive use of sighted assistance.
2. This procedure applies to "drop off" lessons within the limitations created by and established for the lesson (refer Sectioln 9 III below)

C. Procedures

1. Establish Location and/or Direction
   - a. Stop. Then utilize available sensory information such as the sun or traffic flow.
   - b. If necessary, refer to last known direction of travel, adjust for the number and direction of turns, and verify present direction by utilizing available sensory information.
   - c. If possible and needed, reverse the route or line of travel and return to a landmark or known location.
   - d. If a-c are not successful or possible, travel to the nearest source of sensory information such as elevator bell, pedestrian traffic or heavily traveled street.
2. Search Pattern
   - a. When disoriented, always travel in a straight line until a boundary or landmark is located.

    b. Interpret sensory informaton while traveling to assist in determining direction and location.
    c. Once a boundary or known wall, corridor or street is located, stay in contact with that known until additional information is located to achieve knowledge of direction and exact location.

III. DROP-OFF LESSONS

A. Objectives: To disorient the blind person in a familiar or unfamiliar environment so that he will utilize available sensory information and apply reorientation procedures to achieve the following:

1. Practice and reinforcement of re-orientation procedures;
2. Develop confidence in his re-orientation ability;
3. And/or test his ability to re-orient himself.

B. Applications

1. This type of lesson may be utilized in every travel environment one or more times to achieve the objectives.
2. This type of lesson may be utilized as an evaluation to determine readiness to progress to a higher level orientation problem or more complex travel environment.

C. Instructor Porcedures

1. Assess the capabilities of the blind person regarding utilization of sensory information and application of this information to determining direction and location.
2. Assess the available sensory information in the travel environment.
3. Match the environment and re-orientation problem to the blind person's capabilities.
4. Bring the blind person to the environment without describing the nature of the lesson.
5. Approach the environment circuitously so that the blind person is not aware of the exact location or direction.
6. Describe the boundaries of the area and the procedures for re-orientation (refer Section 9, 11, above)
7. Describe the limitations of the lesson regarding use of sighted assistance and the means of demonstrating re-orientaion, i.e., finding a destination or signaling the instructor.
8. Objectives include requiring that the blind person go to a specific destination, determine where they were dropped off or identify their present location.

D. Uses of Areas

1. Limited Area
    a. Utilize a limited area such as a small room, one floor or small area of a building, front walk, driveway, etc. to teach and practice re-orientation procedure or parts thereof.
    b. Limited areas lend themselves to introductory drop-off lessons because of the increased possibility of successful

completion and because of the short period of time required for results.

2. Extended Area
    a. Utilize a whole building, neighborhood or other extended area for more diffidult and/or complex drop-off lessons.
    b. Variations in extended area
        (1) Periphery
            (a) While still learning an area, a drop-off on the periphery affords a limited re-orientation problem.
            (b) The blind person is "dropped off" at a boundary wall, corridor or street and required to determine his position by utilizing sensory information available at that point.
            (c) Introductory periphery drop-off would take place at a corner of the area such as the intersection of two boundary streets.
            (d) Time remaining on such limited drop-offs may be utilized by route completion or route planning and execution.
        (2) Central
            (a) After an area has been utilized extensively for travel, a drop-off in the central section of the area or in a portion of the area without obvious distinguishing characteristics provides an advanced re-orientation problem.
            (b) In order to successfully re-orient himself in this lesson, the blind person should have an advanced orientation.reference system, be able to recognize the area boundaries, know the distinguishing characteristics of the area, and be able to utilize sensory information for re-orientation purposes.
3. Unfamiliar Area
    a. An unfamiliar area may be used to teach and apply re-orientation procedures by giving a generic destination as the means of demonstrating re-orientation.
    b. Examples of such usage includes:
        (1) Drop-off in unfamiliar building and locate the lobby;
        (2) Drop-off in a driveway and locate the nearest street corner in an unfamiliar area;
        (3) Drop-off in an unfamiliar neighborhood and locate a bus stop or specific store.

SECTION 10 SEQUENCING

This section is designed to provide several of the most common sequences that occur in learning and teaching. After each sequence, one or more examples will be given. With regard to these examples, the following points should be understood:

1. Time and space do not permit the citing of even a cross section of applications of a sequence. Therefore, if the example given for a sequence deals with teaching motor skills this does not imply that the same sequence could not apply to teaching concepts or stair travel.
2. The sequences given are more continuums rather than steps. For convenience, however, they are listed as a specific number of steps. This does not mean that the number of steps listed is the correct or only number. In the example "Levels of Skill", four steps are listed. This is not meant to imply that there are only four levels of skill, or that a skill should be taught in four lessons or segments.

I. General Model of Sequencing

As a general rule, the Peripatologist assists the blind client to learn the necessary skills and procedures, apply this learning in appropriate environments and to make decisions and solve travel problems independently. Each lesson then can be viewed as a composite of 3 variables:

A. Content: The peripatologist sequences the material to be learned (skills and procedures) to begin with the easiest and simplest and increasing in difficulty and complexity. The continuums listed as "easy to difficult" and "simple to complex" are thus most applicable to the content variable.

B. Environments: Teaching environments are usually chosen in such a manner that the client can concentrate on new material to be learned. When the material to be learned is the environment itself, the peripatologist controls the interaction. He introduces the client gradually to travel environments rather than exposing him to the "real" world before the client has the skills, procedures and confidence necessary to cope with advanced travel areas. As an umbrella sequence, a continuum from "controlled to uncontrolled (real world)" best characterizes the presentation of environments. Numerous sequences are appropriate here: "easy to difficult", "simple to complex", "regular to irregular", "quiet to noisy", "familiar to unfamiliar", and others.

C. Relationship: If the blind client is to achieve independence, the instructor must encourage the client to take increasing responsibility for decisions affecting safety and orientation and to solve appropriate travel problems without assistance. Thus, the sequence "assisted to unassisted" best characterizes the sequencial relationship between peripatologist and blind client.

II. Sequences

A. Simple to Complex. This continuum suggests that learning experiences be sequenced according to the number of steps involved, number of body parts involved, type and nature of spatial

arrangement, etc. The examples given are concerned with choice of environments for learning or applying a procedure (Familiarization) and for teaching motor skills.

Example #1. Choosing Rooms of Familiarization Lessons

a. The instructor would attempt to first use a room which was small, square and has furniture arranged in a regular configuration. A classroom with desks in rows would be such a room.

b. A more complex room would be one in which the placement of the furniture would be less predictable or in which the shape of the room was less regular. A small lounge might have furniture in the center and/or on the periphery of the room and there would be several types of furniture (sofas, chairs, tables, etc.). An "L" shaped room might be treated as if it were two rectangles to be explored separately, then integrated into a concept of a single room.

c. A complex room would be one in which: the shape is very irregular; the types of furniture or objects have no definable pattern of spatial location; there are multiple entrances and exits; etc. The lobby of Higgins Hall on Boston College Campus is an example of a complex room.

Example #2. Teaching Motor Skills in Peripatology

a. Trailing. The instructor may choose to introduce trailing before any other techniques in peripatology (except sighted guide) because it is perhaps the simplest for the following reasons:
   (1) To assume the technique, the blind person moves the appropriate arm forward from a natural, relaxed position. The motion is thru only two planes-forward and vertical.
   (2) The motion for assuming the prescribed position eminates from only one joint - the shoulder.
   (3) The entire arm/hand are held stationary while walking.
   (4) The hand is held in contact with a wall which helps control the placement of the hand laterally. The contact with the wall also affords the client a degree of security not found when traveling in "free" space.

b. Lower Protective Technique. This skill is more complex for the following reasons:
   (1) To assume the prescribed position, the arm is moved forward and toward the center of the body. The motion is thru three planes - forward, lateral and vertical.
   (2) The arm/hand are held in free space, without contact with any environmental surface.

c. Upper Protective Technique. This skill is more complex than lower protective technique for the following reasons:
   (1) To assume the prescribed position, the arm is bent at the elbow and wrist. The motion eminates from three joints - shoulder, elbow and wrist (each of which scribes a different angle).

B. Easy to Difficult. The example given illustrates the fact that initial material or problems are presented in order to insure success. Subsequent tasks require the client to apply higher levels of skill, possess more advanced spatial orientation, deal with more complex environments, etc.

Example # 1. Choosing Areas for Drop-Offs (See Section 9). When providing the client with tasks which require spatial problem solving, the peripatologist should sequence the spatial environments chosen to insure initial success while graduating the difficulty of the task. The following illustrate this point:

(a) Indoor drop-offs progressing from a room to a floor of a building to an entire building;

(b) Outdoor drop-offs progressing from a single block to a four square-block area to an entire neighborhood.

C. Static to Dynamic. This continuum suggests that lack of motion or the ability to control motion in a learning experience simplifies the task. The variables involved are motion of the learner and motion of objects (sources of sensory information). The examples given are concerned with auditory localization and teaching a specific motor skill.

Example #1. Auditory Localization

(a) Client Stationary/Sound Source Stationary. This situation would allow the client to make repeated observations (assuming a continuous sound) in order to judge the location of the sound source. No adjustment need be made for motion.

(b) Client Moving/Sound Source Stationary. This situation also allows for repeated observations of the stationary sound source. It is a more difficult task in that the client must fixate perceptual attention on the sound source while he is in motion. In the task, the client has knowledge of and control over the speed and direction of motion.

(c) Client Stationary/Sound Source Moving. The increased difficulty in this task arises because the client has no control over the speed and direction of the moving sound source.

(d) Client Moving/Sound Source Moving. This task is the most difficult and complex because he must monitor his own speed and direction while having no control over the speed and direction of the sound source.

Example #2 Teaching Upper Protective Technique.

(a) Client Stationary. The instructor introduces the skill and allows the client to learn how to assume the proper position while the client is standing still.

(b) Client Moving (With Assistance). When the client begins to move, the instructor may guide him in various ways (see "Guiding" sequence) to allow the client to concentrate on maintaining the proper protective position.

(c) Client Moving (Without Assistance). At this level, the client is responsible for maintaining the proper protective position while also monitoring his line of travel and the environment.

D. Concrete to Abstract. When employing this sequence, the peripatologist sequences material or tasks beginning with the most physically available or tangible and progressing to those which are purely cognitive. The examples demonstrate a sequence of presentations of a concept and a sequence of reference systems.

Example #1 Demonstrating Examples of the Concept "L" Shape.

(a) The peripatologist shows the client an "L" shape utilizing the client's arm. The client gets internal sensory information (proprioceptive) and external/internal sensory information (haptic).

(b) The peripatologist shows the client an "L" shape utilizing a graphic aid. The client gets haptic sensory information.

(c) The client is directed to walk an "L" shaped route, trailing a table and listening to a stationary sound source which highlights home base (and/or the destination).

(d) The client walks an "L" shaped route in free space without any sound cues.

Example #2. Reference Systems (see Section 2)

(a) Egocentric reference systems are based upon the client. The client is always the referrant is these systems, that is, the world is organized around the individual's present position. Types include directionality and the clock analogy.

(b) Objective reference systems graduate in abstractness when progressing from Sensory Data to Schematic/Abstract.

  (1) Sensory Data reference systems are based upon referrants that are available to the senses such as the self and objects.

  (2) Schematic/Abstract reference systems are based upon referrants that are not currently available to the senses, i.e., they are conceptual in nature.

E. Travel Patterns. The sequence of travel patterns is a combination of the "simple-complex" and "easy to difficult" sequences. These patterns are the most common ones and apply thru all areas of travel.

1. The "i-shaped" route is a simple straight line forward. Spatial relationships change in one plane (front/back) only. The reverse of the "i-shaped" route returns along the same travel path to the starting point.
2. The "L-shaped" route builds upon the "i-shaped" route by adding a 90° turn and a second "i-shaped" route. Spatial relationships change in two planes in the front-back plane and the left-right plane. The reverse of this route takes the same travel path to the starting point but the turn is in the opposite direction. The alternate route takes a different path to the starting point but employs the same direction turn. The alternate route takes the traveler "around the block" or a square/rectangular pattern.
3. The "U-shaped" route adds 1 turn and a third travel direction to the "L-shaped" route. This route involves 2 turns in the same direction (both left or both right) and 3 travel directions. Spatial relationships change twice in each of two planes of space. The reverse of this route utilizes the same path to the starting point but opposite turns. The alternate route to the starting point takes a different path and a similar turn to complete the square/rectangular pattern.
4. The Z-shaped" or "stair-step" route involves two travel directions and two or more turns. The turns are sequentially

opposite each other (left then right or right then left). Spatial relationships change at every turn. The reverse of this route utilizes the same travel path but the turns are sequentially opposite. The alternate route or routes are never the identical pattern and require at least one less turn. When employed in a grid pattern of streets, at least one street must be crossed to employ this pattern.

F. Near to Far. The underlying assumption in this sequence is that the near environment is more concrete, more accessible and more manipulative than the distant environment.

Example #1. Monitoring Turns.

When learning how turns alter spatial relationships, the client benefits from tangible feedback in the initial stage.

(a) The client makes a 90° turn while keeping his hands on two chairs, one in front and one in the direction of the turn (left). He then notes the difference in spatial relationship after the turn, i.e., the chair that was in front is now to his right and the chair that was to the left is now in front of him.

(b) The client makes a 90° turn in the presence of a sound source in the room. After the turn, the client notes the difference in the spatial relationship to the source.

(c) The client makes a 90° turn while listening to traffic at a distance.

G. Controlled to Uncontrolled (Real) Environments. The peripatologist will interact with and control the teaching and travel environments to the extent as is necessary to ensure the client safety and security, skill and procedure progression and problem solving progression.

Example #1 Door Control in Route Travel.

When learning a new route while trailing with the hand, most clients find it easier to travel with the doors to be passed along the route closed.

(a) Instructor closes all the doors along the walls to be trailed. Client learns the route without having to cross open doorways.

(b) The instructor demonstrates the method for trailing past an open doorway. The client is told (or shown) which door is open and then travels the route.

(c) The instructor opens one or more doors and the client travels the route without prior knowledge of which doors are open.

(d) The instructor allows the doors to remain open or closed as they naturally occur. The client travels the "uncontrolled" route.

Example #2 Turning Traffic at a Street Crossing.

The presence of turning traffic increases the complexity of the sound pattern at an intersection and creates anxiety in the client. Besides attempting to choose an intersection without turning traffic, the instructor can "control" traffic to a certain degree.

(a) The instructor can walk into the street to "freeze" cars before they turn or use hand signals to achieve the same objective before the light changes.

(b) The instructor can tell the client how many cars are turning and from which direction and then cue the crossing.

(c) The instructor can tell the client that there will be turning traffic but not detail the number and direction.
(d) The instructor allows the client to cross without any intervention.

H. Familiar to Unfamiliar. This sequence assumes that beginning in a familiar environment or with familiar material will provide a base of knowledge and security which facilitates new learning. Example #1. Teaching Motor Skills. When introducing a new motor skill, the peripatologist will choose a comfortable, secure environment so that the client can concentrate on motor learning. When the client demonstrates learning, the instructor can have the client apply the skill in less familiar environments such as a different floor of the same building and then a different building.

I. Regular (Consistent) to Irregualr. This sequence highlights the concept of "environmental redundancy" presented by Emerson Fonlke. If environments are predictable, travel is facilitated.
Example #1. Neighborhood Streets.
In choosing a beginning residential travel area, the peripatologist looks for a "grid" pattern of streets. Thus the client begins outdoor travel in an area in which the block length, block shape and intersections are similar and predictable. As the client masters this area, travel should progress into areas in which the environment is increasingly less predictable.
Example #2. Intersections.
When teaching street crossings, the peripatologist introduces the procedure at a "regular" plus shaped intersection with little or no traffic. Lessons progress thru intersections that are less spatially consistent (e.g., "T", offset) and thru less predictable traffic patterns.

J. Unobstructed to Congested. This sequence reflects the fact that travel in "wide-open" areas is faster and less anxiety provoking than travel in confined, cluttered areas.
Example #1 Travel in Hallways
Lane travel lessons are sequenced so that the client begins in halls that are free from objects and people. The progression usually introduces stationary objects before pedestrian congestion. This same sequence would apply to sidewalk travel.

K. Quiet to Noisy. When applying this sequence, the peripatologist is attempting to eliminate tension and distractions which interfere with evaluations and learning. Progression in this sequence introduces the client to a broader range of environments to apply learning or to demonstrate abilities under different circumstances.
Example #1. Testing Auditory Perception and Localization of Traffic.
(a) Evaluation would begin at a quiet street, away from an intersection, that has light traffic. Ideally, a single car could be perceived.
(b) Evaluation would continue with sightly heavier traffic so that cars would approach from opposite directions alone and

also simultaneously. The effects of one car masking another could be noted.

(c) The next location for evaluation would be at an intersection where light traffic would approach from four directions and where some of the traffic would turn.

(d) Evaluations would progress in like manner in areas with increasing volume of traffic and at increasingly complex intersections.

Example #2. Teaching Sidewalk Travel.

(a) Initial instruction in sidewalk travel should begin in a quiet area, away from vehicular or pedestrian noise. This would preclude travel near schools during recess or gym periods.

(b) Once the client was comfortable with sidewalk travel in very quiet areas, part of a progression of lessons would include exposure to noiser areas.

L. Elementary/Intermediate/Advanced. Content and environments are often arranged in simple, three-level gradations. This form is most frequently found in sequencing residential and business environments. (refer "Factors Related to the Context of a Learning Experience - Residential Travel", p. E.24).

M. Assisted to Unassisted. At the beginning of training and at the beginning of each new unit of training, the peripatologist will assume a very active role in presenting new material and in decision making. The major goal of "independence" is facilitated however, by continual shifting of responsibility onto the client.

Example #1 Route Planning and Travel.

(a) Instructor plans the route and assists the client in traveling it.
(b) Instructor plans the route, but the client completes it without assistance.
(c) Instructor and client plan the route and client travels it.
(d) Client plans the route with assistance, then travels it.
(e) Client plans, verbalizes route and then travels it.
(f) Client plans and travels route without assistance.

Example #2. Learning Trailing Technique.

(a) The instructor physically manipulates the client's arm into the prescribed position and describes the salient characteristics of the technique.
(b) The client attempts to assume the position with verbal and physical corrections by the instructor.
(c) The client assumes the position with verbal corrections by the instructor.
(d) The client assumes the position without assistance.

N. Guiding. The peripatologist has numerous occasions in which to guide a client. These include providing for safety, promoting security in the client and taking the client in a straight line. To assist the client from dependence to independence in travel, the peripatologist sequences guiding assistance.

1. Sighted Guide. This meets the purposes of safety, security and straight line travel as an initial guiding method. The

drawbacks, however, include the facts that the guide may be standing in the client's auditory and visual fields and may actually interfere with the execution of techniques.

2. Physical Contact. The instructor stands beside or behind the client and places a hand on his shoulder or back. Thus, the instructor can control the speed and direction of movement without interfering in perception or technique. This method still provides a high degree of security for the client. This type of contact can also be sequenced as follows:
    (a) Constant. The instructor maintains contact for the entire distance traveled;
    (b) Intermediate. The instructor maintains contact for those periods when security, straight line travel or safety dictate.
    (c) Single Contact. The instructor contacts the client in the beginning as a "starter" measure for straight line travel primarily.
3. Voice or other Sound Source. At this level, the instructor talks to the client or uses a sound source as a target for straight line travel. During this type of guiding the client must shift attention from the motor skill (e.g., cane travel) to try to localize the voice or sound and change direction accordingly. A degree of security is afforded the client, especially when voice contact is frequent. This type of guiding may also be sequenced as follows:
    (a) Distance
        (1) Near - 6 to 10ft.
        (2) Intermediate - 10 to 20ft.
        (3) Ultimate Travel Distance - common distances that require a straight line of travel include the widths of 2 and 4 lane streets, the width of a residential driveway, etc.
    (b) Frequency.
        (1) Constant voice or sound source contact.
        (2) Intermediate contact "as needed".
        (3) Single contact to indicate desired objective.

    The peripatologist will adjust the distance and frequency variables as the client gains confidence and skill.

O. Corrections. The peripatologist must frequently intervene in lessons, especially when new material is being learned, in order to correct technique. The following sequence suggests a progression in the client's execution of the technique and ability to process the feedback from the instructor. The three variables are: (1) Client static vs dynamic; (2) Instructor making an explanation of the error and the means of correcting it to a single word cue for correction; and (3) Instructor physically manipulating the client into correct position to physically cueing the correction to no physical contact.
(1) Client static/Instructor explains (statement)/Instructor manipulates
(2) Client static/Instructor explains (statement)/Instructor physically cues

(3) Client static/Instructor describes error/Instructor physically cues
(4) Client static/Instructor describes (command)/No physical cue
(5) Client dynamic/Instructor describes (commmand)/No physical cue
(6) Client dynamic/Instructor verbally cues/No physical cue
(7) Client dynamic/No instructor assistance/Client self-corrects

P. Levels of Motor Skill Performance. In addition to the client's ability to process instructor assistance while performing a motor skill achievement by the circumstances under which the skill is performed.

(1) Conditions of Drill. Under these circumstances repeated feedback is given to the client.
(2) Conditions of Verbal Reinforcement. The client can perform the skill with instructor reinforcement of technique.
(3) Routine Conditions. The client is able to maintain skill level while processing sensory information and traveling a non-stressful route.
(4) Stressful or Pressure Circumstances. The client can maintain skill level despite the immediate circumstances (e.g., maintain good cane technique during a street crossing at a heavily trafficed intersection).

Q. Instructor Positions. The peripatologist changes position relative to the client dependent upon the degree and type of assistance the client may need.

(1) Safety.
At this level, the client needs to know that the instructor is physically close (if not actually in contact) and will intervene if necessary for safety reasons. An example is the instructor's position on stairs (in front and diagonally to the side) to prevent the client from falling.

(2) Security.
The instructor's presence is made known to the client in order to give confidence or relieve anxiety. Examples include close and constant voice contact when a client is beginning travel in "free" space and the instructor's proximity during initial street crossings.

(3) Physical Assistance and Control.
The instructor is positioned very near the client in order to prevent error or accident. Unlike the previous levels, the client may not be aware of the instructor's proximate positioning. This will allow for more confidence and psychological independence. An example would be when the peripatologist moves close to the client who is approaching a set of descending stairs.

4. Environmental Control.
At this level, the peripatologist is positioned to control something in the environment which would interfere with the objectives of the lesson. Examples include the instructor's intercepting helpful pedestrians before they interrupt the client's street crossing or the instructor stepping into the street to "freeze" cars before they turn across the client's path.

5. Voice Control.
   At this level, the instructor can only intervene verbally for safety reasons. This level implies an agreed upon physical separation such that the client is assuming responsibility for safety. An example is the instructor's positioning across a street that the client is preparing to cross.
6. Observation Distance.
   These positions are assumed when the client is prepared for complete responsibility for safety during the training unit and the instructor does not want to be noticed by the public or the client. Such a position includes observing a bus travel lesson from a following car or observing a lesson from across the street and ½ a block away.
7. Solo Lesson.
   On a solo lesson, the peripatologist does not observe the client, staying instead in the office and drinking herb tea!

APPENDIX A GLOSSARY

ALIGNING - establishing a parallel relationship to a direction indicator.

ARTICULAR SENSORY INFORMATION - sensory information arising from receptors in the joints of the body concerning joint position and movement. (refer Proprioceptive Sensory Information).

BILATERAL - having two sides; of or affecting both sides (of the body, hearing, vision, etc.) or utilizing both sides.

BINAURAL - of, relation to, or used with both ears.

BODY AWARENESS - a psychological and cognitive composite of the following:

1. Knowledge of the relationship of the body parts to the whole and to each other;
2. Knowledge of the potential for movement of the body parts and how they relate to each other in movement;
3. Knowledge of the space the body and body parts occupy while stationary and while moving;
4. The ability to name the body parts and the body planes;
5. The ability to utilize the body and the body parts to accomplish specified tasks.

CLUE - sensory information indicating: 1) object identification; 2) spatial relationships

Characteristics

1. Permanence - long term availability; continuous in time and space.
2. Constancy - short term availability; invariable; unchanging; continual.
3. Recognizability - ease of detection relative to figure/ground.
4. Accessibility - ease of detection relative to spatial location.

CONCEPT - a composite of elements forming an idea of one object; represents a group of experiences with a common denominator (the class or category that forms a concept is not in itself observable).

CONCEPTUALIZATION - a process by which one utilizes a symbol to represent a common element from several sensory experiences; includes the ability to abstract and categorize.

CUTANEOUS SENSORY INFORMATION - a composite of sensory information arising from receptors in the skin, especially tactual (touch) and thermal (temperature) sensory information.

DIRECTIONALITY - the division and organization of external space utilizing the triordinate system of body awareness as the primary referent; egocentric division of space into "front/back, right/left, above/below" relative to self.

DIRECTION INDICATOR - environmental sensory information which is utilized to establish a line of travel and/or is utilized as a reference point (referent).

DIRECTION TAKING - utilizing environmental sensory information to establish a definite position in the environment and to establish a desired line of travel.

ECHOLOCATION - the techniques of locating objects by emitting sounds and interpreting the echoes; sounds are generated and perceived by the same individual.

EXPANSION JOINT - a line or fissure designed into sidewalks or between sidewalks and adjoining surfaces to allow for expansion of the surface materials due to heat or cold.

FACIAL VISION - the term applied to the once widely held belief that objects could be perceived through skin sensations (refer Object Perception).

GUIDELINE - a line resulting from the meeting of two surfaces. For example, the line formed when grass and sidewalk meet or when street and dirt shoulder meet. Sometimes referred to as "shoreline".

HAPTIC PERCEPTION - perception yielding spatial judgements of size, shape, location, etc. arising from a composite of tactual and proprioceptive sensory information.

IMAGERY - sensations or information previously perceived and stored; stored experiences as "sensory images"; usually non-verbal (quality, emotion, congifuration, etc.)

KINESTHETIC SENSORY INFORMATION - sensory information arising from receptors in the muscles of the body concerning muscular tension and movement (refer Proprioceptive Sensory Information).

LANDMARK-PRIMARY CLUE - a clue which indicates spatial relationships and which is Permanent, Constant, Recognizable and Accessible (refer CLUE).

LATERALITY - an awareness of the neurological and anatomical division of the body into two sides; learned through monitoring and executing movement; not handedness or dominance nor is it naming of the sides.

LOCALIZING - utilizing sensory information to make a judgement of a self-object spatial relationship.

MASKING SOUND - a sound which interferes with the reception of or blocks out a desired sound.

MOBILITY - the process of moving from one's present position to a desired locale safely and effectively with and/or without the use of a travel aid. This process is facilitated by the orientation process.

MOTOR-SENSORY MOVEMENT - movement for the primary purpose of motor-muscular development which is monitored by the sensory systems.

APPENDIX C: OUTLINES AND BIBLIOGRAPHIES

Outline: Motor-Kinesthetic System

The following areas are to considered within the limits of their relevancy to a Peripatologist. For purposes of this topic it is to be assumed that the blind person has a reasonable understanding of concepts but awareness and efficiency need attention.

A. Postural-Locomotive System
  1. developmental stages-sequence and components
  2. sensory mode(s) involved in terms of contributions to the perceptual system
  3. suggested guideposts and sequence in learning a motor task

B. Body Awareness; Posture
  1. relationship of body parts to each other (static and dynamic state; as separate entities and as integral part of whole)
  2. posture-standing, sitting, walking
  3. Aids: Models, body contact/exploration, etc.
    a. components of acceptable, efficient posture
    b. affects on appearance, locomotion (veer) environmental searching/exploration, balance, structural integrity

Note: Efficient movement depends upon awareness of spatiality of body and environs

C. Veer-deviation from intended line of walk
  1. consider affect by: asymmetry of body-structural, functional perceptual and/or conceptual organization/distortion; stride pattern - imbalance of thrust, direction, force; reaction to sensory information; attention; etc.
  2. Principles of reference and rhythm
    a. reference - external clue; also see "B, Note" above
    b. rhythm symmetrical "beat"
  3. with and without cane
  4. Aids: tactual, auditory (e.g. metronome), textured walk, etc.

D. Turn-change of direction
  1. turning in place; turning on the move
    a. discrete and related

  Note: Usually problem is not one of turning per se but one of how much

  2. Affect of perceptual and/or conceptual organization/distortion
  3. Aids: poles, auditory clue, model, etc.

E. Side step - change of location
  1. desireable width
  2. direction of feet
  3. Aids: model, base board, auditory clue, etc.

F. Locomotor Patterns
  1. combine veer, turn, sidestep: for purposes of recognition serial memory and efficiency (not spatial orientation)
  2. with and without sensory clues, distraction, cane

G. Slanted Planes

H. Distance Judgment

Note: Coordinate efforts with physical educators/therapists, doctors (tests/exercises for: Neurological involvement, fitness, strength, balance, agility, flexibility, endurance, coordination, etc.)

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Outline: Tactual-Haptic System

I. Properties of Object/Map

- A. Object: width/height/depth; sensory factors; friction
  1. surface, density, size, direction, shape, proportion, relationship between parts, structure
  2. first to appear: temperature, texture, density
     second to appear: regularity of surface, size
     third to appear: structural elements (problem of shading a blue print)

Note: Touch sensations remain dominant over temporal-motor ones

- B. Map
  1. materials
  2. symbols
  3. criteria for construction

II. Development of Form Perception

- A. Depends on learned coordinates of space
- B. Stages
  1. globular form-totality with no parts or relation of parts (response to elements)
  2. analytic-differentiation of parts
  3. integrated form (response to a situation)
- C. Sequence
  1. basic tactile awareness: texture, temperature, etc.
  2. tactile matching/tactile discrimination (gradation)
  3. stereognosis
- D. Touch
  1. sweeping; homogeneity of surface, texture (nothing about directionality or length)
  2. grasping: length and extension of surface
  3. structuring: analytic and synthetic, both hands used in active exploration; "object-directedness of motor pattern"

III. Method of Exploration

- A. Reference Point (home base)
  1. "look" for direction and location of parts in relation to home base and to each other
- B. Object properties (see "I" above)

C. Spatial properties: position, location, direction, distance

D. Perspective: one directional vs. multi-directional

IV. Obstacles vs. Objects

A. Undifferentiated to sensory-motor to objective reality

B. Negate subjective sensory experience in order to establish the external nature of the object

C. Tactual-Motor sequence: spatial sequence; synthetic unity

V. Posture/Body Orientation

A. Influence on Range, freedom and coordination of movement in terms of affect on object exploration - "reading"

B. Affect of object orientation on recognition

VI. Consider the following:

A. Purpose(s), limitations, criteria for choosing model or aid

B. Tactual-Haptic system ("I-V" above) when cane is part of system

C. Factors concerning -
  1. how and when to present/use a tactual aid
  2. map/object discrimination readiness
  3. "training" experiences
  4. Affect of texture, on recognition

D. Tactual information through the feet and cane

E. Samples of Aids

F. Implementation with totally blind - partially sighted, congenitally blind - adventitiously blind, child/adult/elderly

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Gary R. Snyder (1982)

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Outline: Auditory System

That sense which is important to most people who are blind as a source of information about his environment is hearing. Our goal is to help him increase his hearing efficiency; that is, help him to become a more effective listener and user of sound.

The following outline is intended to offer some of the areas and factors to consider when working with auditory information.

A. Awareness and Identification

1. active listening habit-selective; critical
2. factors in determining differences; loudness, pitch, tonal quality, temporal element.
3. awareness - can be enhanced and/or acquired by direct involvement with guided attention and guided practice.
4. aid in: determining danger, speed, mood, identification of area or object (clue for orientation), etc.

Note: Use of records, tapes and actual sources

B. Sound Localization

1. Three coordinates for spatial structure; azimuth, elevation, distance;
   a) degree of accuracy
   b) discrete vs. continuous sound
2. Importance of body alignment
3. Use of sound: goal vs. reference point and their related spatial considerations (e.g.: avoid an obstacle; speaking to a person-directional flow of voice; bus door; porch chimes, etc.)

Note: consider
- a. verbal response vs. verbal/pointing/approaching
- b. indoors vs. outdoors-affect weather conditions have
- c. masking; shadow; echo
- d. application of identification and localization elements to use sound-soliciting aid

C. Sound Tracing

D. Sound Alignment

1. Dynamics: perpendicular, parallel, diagonal;
   - a. sound line of traffic divided; approach, passing, departure;
   - b. intensity change; Doppler Effect
2. How to Correct for Error
   - a. if sound is continuous
   - b. if sound is not continuous

Note: use of sound sources indoors

E. Paralleling Sound Source

F. Sound Pattern
   1. Determination of intersection configuration
   2. Indoors: arrangement of unfamiliar area-depot, subway station, etc.

G. Sound Reflection (facial vision)
   1. refer to Dallenbach's experiments
   2. Consider:
      a) sound characteristics of source and area
      b) indoors vs. outdoors
      c) with and without cane

Note: 1. use of fibre board
      2. place in training program (when?)

H. Distance

   1. Usually determined by a change in intensity; loudness is not perceived as a one-to-one relationship to intensity (plateaus)
   2. Intensity affected by:
      a) distance
      b) quality of sound source
      c) acoustical qualities of area
      d) atmospheric elements
      e) physical-physiological-emotional elements

Note: Use of stationary and moving sounds, indoors and outdoors.

I. Auditory Imbalance
J. Hearing Aids

Note: 1. Application of above to be considered for: child, adult, elderly groups with and without physical, sensory, intellectual and emotional involvement.
      2. Consider the following aspects/skills which are included in a person's interaction with auditory information.

         a. auditory reception (acuity)
         b. listening style or attitude
         c. auditory decoding-identification, understanding of sounds
         d. auditory memory/sequencing
         e. auditory differentiation/discrimination
         f. auditory localization
         g. auditory pursuit
         h. auditory form discrimination
         i. auditory figure-ground differentiation
         j. perceptual (auditory) - motor integration

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Outline: Low Vision

1. Partial Sight-Useful Residual Vision
    - a. definition-congenital, adventitious
    - b. nature of-quantitative and qualitative factors
    - c. testing for central, peripheral: static, dynamic
    - d. low vision aids-near, distant; tinted lenses; basic function and principles of use.
        - 1. application to orientation and mobility

2. Consider the relevance of the following items on attached sheet entitled, "Partially Sighted Client":

    - a. "A. General Factors"
    - b. "B. Factors Concerning Illumination"
    - c. "C. Sample Chart for Gathering Performance Data"
    - d. "D. Considerations Concerning Lessons"

3. Factors to consider in observing, assessing, formulating visually impaired person's performance/experience (in addition to "2,d" above)

    - a. visual perceptual skills as they relate to low vision (see "Considerations When Working With Low Vision Students")
    - b. concepts as they relate to people with low vision: formation of concepts influence of level of attainment on the "looking" process
    - c. importance of critical questioning/listening by the instructor and multi-sensory approach
    - d. 1. what indicates that client sees what he states he sees? (verbal and non-verbal response)
        - 2. affect of weather and seasonal changes on available information
    - e. relevance of a conventional orientation and mobility program
    - f. relevance of spatial orientation exercises
        - 1. possible use of small maps to see and use on route
        - 2. implication of detours-corridor, sidewalk, entire street
    - g. use of obstacle course-differ locale, height, size, color, of obstacles
    - h. what to look for? Where (probability of existence and location)? How?
        - 1. within the block; quidelines, lights, etc.
        - 2. approach to curb; - "more light" traffic, curb, etc.
        - 3. intersection: configuration, traffic regulations, risks; public assistance; students strategy etc.
    - i. suggested sequence of visual perception - see "The Developmental Concept Applied to Visual Training" and "Increased Visual Behavior in Low Vision Children"
    - j. Materials/programs in development of visual perception as they relate to low vision.

Partially Sighted Client

A. General Factors
  1. Data
    a. age; physical/sensory/mental/emotional information; educational and experiential history
    b. eye report concerning acuity, date of onset, etc.
    c. prognosis of vision status-progressive? stable?
  2. Investigate the actual and/or possible use of low vision aids; tinted lenses, occlusion.
  3. Consider the following variables of visual functioning:
    a. Location (occular) or reception
    b. Level of illumination (see "B" below)
    c. size of object
    d. distance forward, peripheral
    e. depth perception
    f. intensity of stimulus-color, contrast (seasons)
    g. time-how long is stimulus available? how long does student require to find, focus, identify?
    h. time of day in terms of efficiency of function: e.g. fatigue, medication
    i. stationary/moving-client and/or object
  4. Use of vision in familiar and unfamiliar areas
  5. Intermodal (sensory) integration
  6. Implementation of cane: would technique modification be appropriate? use in busy area, crossings, transportation, etc.

B. Factors Concerning Illumination
  1. levels of illumination
    a. outdoors
      1. Day (bright sun; hazy sun; cloudy-bright; cloudy-dull)
      2. Dusk
      3. Night
    b. indoors
      1. Natural Light
      2. Overhead Lighting
      3. Side Lighting
  2. In terms of light reflection from objects viewed they might be catagorized as
    a. brilliant subjects: e.g. beach, snow
    b. bright subjects: e.g. nearby people, objects at beach
       Not in shade
    c. Average subjects: e.g. nearby people, houses etc.
       Not in shade
    d. shaded subjects: e.g. people/objects in open shade (shadow of house across sidewalk)
  3. Illumination level constant/changing, consistent/inconsistent

C. Sample chart for gathering performance data
Condition and context of experience: Illumination-Bright sun (without visual aid; familiar area)

Orientation of Illumination source to

object front/side/back	client front/back/side	objects	distance		size	stationary	moving	Col contr
		Curb (, ")	F.P.	F.J.				
		walk-driveway						
		crosswalk						
		pole (telephone street light)						
		Street sign						
		Traffic lights						
		car						
		Baby carriage						
		person						
		bicycle						

Note: Code--F.P.=first perception
F.J.=final judgment
E. =error
C=correct
CL=client
ob=object

D. Considerations Concerning Lessons

1. Visual "tour" - what does the person see utilizing his methods and terminology?
    a. what properties of the object/environs does he attend to Does he know what to attend to? What does he select?
    b. What is student's mode of visual focusing? scanning (eyes and/or head?)
2. Environmental properties relevant to navigating: shape, size, color, stationary/moving, factors of spatial organization, position, location, direction, distance, relationships

Note:

1. this area is critical to the entire process
2. relate the above to environmental needs, e.g. traffic lights, color, size, distance, background distractions, crosswalks; street, and bus signs; room and building numbers, etc.
3. Search Pattern: consider suggesting a systematic scanning procedure; e.g. scan with head and/or eyes in an overlapping pattern horizontal or vertical or both
4. One approach to formulating a lesson in visual experience: determine one object that the student knows and can see then attend to variables of
    a. illumination-same, changing
    b. illumination plus distance-front, sides, up/down
    c. illumination plus movement-toward, away, side to side, up/down
    d. add size, color, background distraction (visual and auditory) limited time to "a", "b", "c".

Bibliography: Low Vision

George Zimmerman (1982)

NOTE: This listing is supplemental to the Bibliography Following Chapter 7 in Foundations of Orientation and Mobility, (New York: AFB), 1980).

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CONSIDERATIONS WHEN WORKING WITH LOW VISION STUDENTS

A. Sequential Pattern of Learning to see:

1.	fixation	1.	large to small
2.	tracking	2.	gross to finer details
3.	identification (form)	3.	simple to analytical
4.	outline		
5.	inner details		
6.	integration		

B. Occular Activity

1.	fixation	3.	Convergence-divergence
2.	accommodation	4.	movement: lateral/up-down/ rotary

C. Uses of Vision (per Gibson)

1. layout of surrounds:
    a. sky-earth determination
    b. gross features
    c. objects
2. detect change or sequence:
    a. day from night
    b. gross motion
3. detect and control locomotion:
    a. register locomotion
    b. guide locomotion

D. Three Major Causes of Visual Structure

1. differential facing
2. differential color (reflectance)
3. shadow

NOTE: consider - discontinuity of informa. (edge, corner, etc.)
- adjacent or dir.: perception-spatial (gestalt)
- successive order: memory-time (serial)

E. Depth Perception (see Psycho or Percept.: M.D. Virnon, Penguin 1962)

1. convergence/divergence
2. retinal disparity effective up to 100 meters
3. size (smaller comparatively)
4. details (shape-texture change)
5. colors/outlines (hazy)
6. interposition (overlay)
7. linear perspective
8. Parallax (apparent perpendicular velocity of movement)

F. Visual-Perceptual Skills

1. vis. identification: ability to see, name, describe (include color)
2. vis. pursuits: ability to follow/track objects and symbols with coordinated eye movement

3. vis. form discrim.: (included perceptual constance exposure and perception of position in space) - ability to visually differentiate forms and symbols
4. vis. figure-ground discrim.: ability to perceive objects in foreground/background and to separate them meaningfully
5. vis. memory: recall prior visual experience
6. vis. motor memory: ability to motorically reproduce prior visual experience
7. vis. motor motor coordination (eye-hand tasks): coordinate small muscle activity with visual intake
8. vis. motor spatial/form manipulation: perception of spatial relationships; ability to manipulate 3-D materials
9. vis. motor integration: ability to integrate total visual motor skills in problem solving

G. Consider following for learning tasks:

1. likenesses-differences; in class, size, position, details
2. matching: forms, objects
3. ordering of objects: size and position sequence
4. grouping objects: class, usage, similarity to other objects, etc.
5. discrim. of missing parts: whole pattern visible; part pattern visible
6. integration: putting together parts into holes (puzzles)
7. recognize and label objects and symbols: categories, function

BASIC VARIABLES AFFECTING FUNCTIONAL VISION

The following are sample questions with regard to an instructor attempting to assess functional vision for the purpose of orientation.

1. FIELD RESTRICTIONS: The client's eyes should be fixated straight ahead. Check in the following areas to determine the client's horizontal field (a) straight ahead, (b) 5 - 45 outward-- away from nose, (c) 45 - 90 outward, (d) 5 - 45 inward (toward nose), (e) 45 - 60 inward. To determine the vertical field, check (a) straight ahead, (b) 5 - 45 upward, (c) 45 - 70 downward. Is the residual field central, peripheral, restricted in certain quadrants? In what position does the client hold his head in order to get most information about his environment?

2. METHOD OF SCANNING: Does the client use head scanning; does he scan both horizontally and vertically? Observe closely to determine whether the client appears to have an organized pattern of scanning which yields the most thorough information for him?

3. ILLUMINATION: Does the client see better on cloudy or sunny days, or in the dark? Indoors, what is the effect of electric and flourescent lighting? If the client is photophobic, is natural or artificial lighting the most irritating? What are the effects of the various sun positions--i.e., in front of him, behind, to the side of him? How does the client react to headlights on cars at night? Can the client recognize major shadows? When the client must adapt to sudden changes in illumination, does he see lights, feel vertigo, see flashes of color, experience "white out", or any other responses?

4. DISTANCE AND DEPTH PERCEPTION: Determine the client's visual operating distance: (a) at what distance can details be detected, (b) at what distance are objects recognized, (c) at what distance is "something" detected? Determine the client's accuracy in estimating distances between himself and a target. If he is not correct in determining depths, does the client realize things seem nearer or farther from him than they really are? Can he compensate for distortions of depth?

5. MOVEMENT: Can the client determine the direction of movement and its speed? Test with the target moving, with the individual moving, and with both moving. Can the client discern the path of travel of the object relative to himself, i.e., is it parallel, perpendicular, angling towards or away from him?

6. COLOR: Which colors are the easiest for the client to recognize? Can he distinguish among different shades of the same color and among different hues?

7. CONTRAST: Test the client using different figure-ground combinations--i.e., bright on dark, dark on bright, bright on bright, and dark on dark.

INDOOR FUNCTIONAL VISION EVALUATION

1. IDENTIFICATION OF ROOM CONFIGURATION: Does the client perceive the basic layout of the room--its dimensions and major characteristics? This includes location of doorways, position of windows, and detection of corners.

2. ESTIMATION OF HALL WIDTHS: Does the client see and adjust to obstacles he is likely to find in a hallway, such as drinking fountains, opened doors? Can he position himself correctly as he navigates the hall?

3. ESTIMATION OF CEILING HEIGHTS: Does the client correct for low ceilings, low hanging light fixtures, etc.?

4. IDENTIFICATION OF LIGHT SOURCES: Can the client determine the number of lamps and lighting fixtures in the room? Compare lit with unlit lamps? Can the client identify windows and walls if they are open/closed?

5. IDENTIFICATION AND NAVIGATION OF FURNITURE: At what distances are pieces of furniture seen? Are these pieces seen as a whole, or in segments? Can the client distinguish among pieces--that is, can he tell where one piece ends and another begins?

6. IDENTIFICATION OF LOW OBJECTS: To test, place an ashtray on the floor. Does the client pick up wastebaskets?

7. IDENTIFICATION OF STAIRS: Determine whether the client can see both ascending and descending stairs, and if he accurately judges the depth of the step. Can he see the end of the flight? Does he focus on each step separately or is his gaze directed at the end of the flight? Does the client affectively negotiate escalators?

8. NEGOTIATION OF DOORWAYS: Does the client distinguish doorways, both leading outdoors and into rooms? Can he estimate door widths correctly? Is he able to deal with revolving doors, folding doors, swinging doors?

9. UTILIZATION OF SIGNS: Determine whether the client can read signs and, if so, from what distances. Does he use contextual clues in determining the sign's message?

10. NEGOTIATION OF CROWDED AREAS: Does the client find it difficult negotiating people within a building? Can he estimate the paths of travel of each person in relation to himself--i.e., are they parallel, perpendicular, angling towards or away from the individual?

FUNCTIONAL VISION EVALUATION

OUTDOOR ENVIRONMENT

1. IDENTIFICATION OF SHORELINES: Does the client recognize and follow both inside and outside shorelines? Can the client use both grass-lines and building lines to maintain a correct line of travel.

2. IDENTIFICATION OF SIDEWALK AND STREET: Does the client differentiate the street from the sidewalk? The street may be darker and more coarse than the sidewalk--does the client make note of and use this contrast? Do broken sidewalks and pavements present any special problems? Does the client understand the width of the sidewalk and travel on it correctly? Does he identify intersecting sidewalks? Is the client able to see crosswalks and stop lines? Can he see the number of lanes and any islands which may be in the middle of the street? Does the client understand the traffic patterns and the method of traffic control used?

3. RECOGNITION OF CURB: Can the client actually see the curb? If so, at what distance? Is he able to see the curb until he is standing on it, or does it appear and disappear for him? Determine if the client can see the opposite sidewalk's curb. How far beyond that can he see? Is he able to determine the depth of the drop-off?

4. DISTINGUISHING HOUSES AND BUILDINGS: Can the client differentiate buildings by size, shape, color? Can he locate driveways and entrances? Can he locate the building number, the porch, the steps. Can he distinguish the number of floors, windows, etc.?

5. USE OF SIGNS: Is the client able to locate street, traffic, store signs? Does he need to use an aid to read the letters? Does the client use contextual clues (size, shape, etc.) to anticipate the sign's message?

6. NEGOTIATION OF OPEN SPACES: Is the client able to cross open spaces effectively? Does he become disoriented in parking lots?

7. IDENTIFICATION OF STAIRS AND SLOPES: Does the client visually detect the first step-up or-down? How well can he judge the depth of the initial step? How much must he slow down in order to safely negotiate the stairs? Can the client visually anticipate slopes--does he have more trouble discerning inclines or declines?

8. RECOGNITION OF VEHICLES: Does the client differentiate among cars, trucks, busses, etc.? What is the effect of the car's headlights at night? Can he identify the objects' pattern of movement in relation to his own position?

9. USE OF PUBLIC TRANSPORTATION: Does the client locate the bus stop easily? When he boards, does he negotiate the door well and place his money correctly? Can the client find a seat without aid and can he visually determine where he should get off? Is the client able to identify the bus by its color? Can he read the destination sign with or without an aid?

FUNCTIONAL VISION EVALUATION--INTERSECTIONS

1. IDENTIFICATION OF INTERSECTION: Determine whether the client can see and separate the intersection and the merging of streets. Does he see all the streets, or only the one beside or in front of him? Can he determine an off-set pattern? Can the client determine the type of traffic control used--no control, stop sign, lights. Make not of how far down the intersecting street the client can see. It may be that he can see enough to be able to make a crossing visually if there is no traffic light.

2. LOCATION OF TRAFFIC LIGHTS: Does the client see all or only part of the light structure? Can he see not only closest signal, but also the ones on opposite, diagonal sidewalks? Can the client locate the walk button? Moving counter-clockwise around the intersection, determine, if the client can see traffic lights and walk lights from every corner. If he cannot, discuss possible reasons why.

3. IDENTIFICATION OF COLORS: Is the client able to see all colors in the traffic lights? Can he see the spots better when they are unlit or lit? Can he differentiate arrows from regular lights?

4. IDENTIFICATION OF WHITE CROSSWALK LINES: Can the client spot the crosswalk lines? Is he able to see them all the way across the street?

5. IDENTIFICATION OF VEHICLES: Can the client distinguish parked vehicles along near and far sidewalks? Is it easier for him to detect moving or stationary cars? When a car approaches, ask the client to verbally note the points at which he can first and last see the car. Check both right to left and left to right travel. Can the client estimate the path of travel of the object relative to himself--i.e., is it parallel, perpendicualr, angling towards or away from the client? At night, do headlights interfere with and effect judgements?

BOSTON COLLEGE

Functional Vision Assessment *

Consider all of the variables affecting functional vision and follow the following guidelines when assessing and training a low vision client. Many of the criteria stated can be evaluated through planned routes and evaluation "trips" to demonstrate performance in addition to actual discussion in a particular environment.

I. INDOOR FUNCTIONAL VISION ASSESSMENT

A. Identification of Room/Hallway Configuration

1. Does the client perceive the basic layout of the room -- its dimensions and major characteristics?

2. Does the client locate and detect

    a. doorways?
    b. position of windows?
    c. corners?

B. Estimation of Hall Widths:

1. Does the client see and adjust to obstacles he/she is likely to find in a hallway such as

    a. drinking fountains?
    b. elevators?
    c. opened doors?

2. Can he/she position himself/herself correctly as client navigates through the hall?

C. Estimation of Ceiling Heights and Overhead Obstacles

Does client correct for low ceilings, low hanging light fixtures, etc?

D. Identification of Light Sources:

1. Can client determine the number of lamps and lighting fixtures in room/hallway? Compare lit with unlit lamps?

2. Can the client identify windows and if they are

    a. open/closed?
    b. covered with window shades/blinds?

3. Can client identify presence of open or closed doors along walls of room/hallway?

* REVISED C28-30

I.

E. Identification and Navigation of Furniture:

1. At what distances are pieces of furniture seen?
2. Are these pieces seen as a whole or in segments?
3. Can the client distinguish among pieces: i.e., ability to distinguish where one piece ends and another begins?

F. Identification of Low Objects: -- To test this ability place an ashtray or wastebasket on the floor. Object used should be

1. of various heights.
2. in different positions in the visual field: i.e., in front; 45° to either side, 90° to either side.
3. produce a variety of figure/ground relationships: i.e., sharp contrast with surroundings, little or no contrast with surroundings

G. Identification of Stairs:

1. Can client see both ascending and descending stairs?
2. Can client accurately judge the depth of each step?
3. Can client see the beginning and end of the flight?
4. Does client focue on each step separately or is his/her gaze directed at the end of the flight?
5. Does the client effectively negotiate escalators?

H. Negotiation of Doorways:

1. Does the client distinguish between doorways leading outdoors and into rooms?
2. Can client estimate door widths correctly?
3. Can client distinguish a closet door from an entrance/exit door?
4. Can individual deal with and negotiate
   a. swinging doors?
   b. revolving doors?
   c. automatic doors?

I. Utilization of Signs:

1. Is client able to read signs? If so
   a. from what distance?
   b. in what lighting?
   c. does contrast of print against background and/or sign itself against surroundings effect visibility?
2. Does client use contextual clues in determining the sign's message?

I.

J. Negotiation of Crowded Areas:

1. Is client able to negotiate around people in a building? Test in both familiar and unfamiliar settings.

2. Can client estimate the paths of travel of each person in relation to himself/herself? Are people moving?

    a. parallel to client's path?
    b. perpendicular to client's path?
    c. toward or away from the client?

II. OUTDOOR FUNCTIONAL VISION ASSESSMENT

A. Identification of Guidelines:

1. Does the client recognize and follow both inside and outside guidelines?

2. Can the client use both grasslines and building lines to maintain a correct line of direction?

B. Identification of Sidewalk and Street:

1. Does the client differentiate the street from the sidewalk? The street may be darker and more coarse than the sidewalk -- does the client make note of and use this contrast?

2. Do broken sidewalk and pavements present any special problems?

3. Do shadows produced by buildings, obstacles etc., on sidewalk present any special problems?

4. Does the client understand this width of the sidewalk and travel on it correctly?

5. Does client identify intersecting sidewalks?

6. Is the client able to see exact point where sidewalk ends (drop-off and street begins?

C. Recognition of Curb:

1. Can the client actually see the curb? If so, at what distance?

2. Is client only able to see the curb when he/she is standing on it?

3. Does the curb appear and disappear for him/her?

4. Is client able to determine the depth of the drop-off? (near and far corners)

5. Determine if the client is able to see the curb on the opposite side of the street.

6. If able to see "far curb", can client distinguish

    a. presence/absence of obstacles, poles, etc.?
    b. presence/absence of people?

II. C.

7. How far beyong the "far curb" can the client see?

D. Distinguishing Houses and Buildings:

1. Can the client differentiate buildings by size, shape, color?

2. Can person locate driveways and building entrance?

3. Can he/she locate

   a. the porch?
   b. presence/absence of steps?
   c. building numbers, addresses, names?

4. Can the client distinguish the number of floors, windows, etc. on the building?

E. Use of Signs:

1. Is the client able to locate

   a. street signs?
   b. traffic signs: i.e., one-way, no parking, etc.?

2. Does client need to use an aid to read the letters?

3. Does the client use contectual clues: i.e., size, shape, location, to anticipate the sign's message?

F. Negotiation of Open Spaces:

1. Is client able to cross open spaces effectively?

2. Does client become disoriented in parking lots, gas stations, etc?

G. Identification of Stairs and Slopes:

1. Does the client visually detect the first step-up or step-down?

2. How well can the client judge the depth of the initial step?

3. How much must he/she slow down in order to safely negotiate the stairs?

4. Can the client visually anticipate slopes? Does he/she have trouble discerning inclines or declines?

H. Recognition of Vehicles:

1. Does the client differentiate among cars, trucks, buses, etc?

2. What is the effect of the car's headlights at night?

3. Can he/she identify the object's pattern of movement in relation to his/her own position? i.e., parallel, perpendicular, same directic opposite direction?

III. FUNCTIONAL VISION ASSESSMENT -- INTERSECTIONS

A. Identification of Intersection:

1. Determine whether the client can see and separate the intersection and the merging of streets.

2. Does client see all the street or only the one that is beside or in front of body?

3. Can client determine an

   a. off-set pattern?
   b. T-shaped pattern?
   c. Y-shaped pattern?

4. Can the client see the number of lanes and any islands which may be in the middle of the street?

5. Does the client understand the traffic patterns and the method of traffic control used?

6. Can client visually determine the type of traffic control used?

   a. no control?
   b. stop signs?
   c. traffic light?

   Make note of how far down the intersecting street the client can see. This may determine client's ability to cross visually when there is no traffic light.

B. Location of Traffic Lights:

1. Does the client see all or only part of the light structure?

2. Can the client see

   a. closest -- same corner signal?
   b. opposite -- far corner signal?
   c. diagonal signal?

3. Can client read "WALK" -- "DON'T WALK" signs? -- Moving counter-clockw around the intersection, determine if the client can see traffic lights and walk lights from every corner. If he/she is unable, consider possi reasons: i.e., position of lighting, distance from light, figure/ground contrast.

C. Identification of Colors:

1. Is the client able to see all colors in the traffic lights?

2. Can he/she see the spots better when they are unlit or lit?

D. Identification of White Crosswalk Lines: (This lesson should be conducted intersections with both the presence and absence of crosswalk lines.)

1. Can the client spot the crosswalk lines?

2. Is he/she able to see them all the way across the street?

III.

E. Identification of Vehicles:

1. Can the client distinguish parked vehicles along near and far sidewalks?

2. Is it easier for client to detect moving or stationary cars?

   When a vehicle approaches, ask the client to verbally note the point which he can first and last see the car. Check both right to left a left to right travel.

3. Can client detect speed of moving vehicles? i.e., determine if vehi are slowing down, accelerating speed, approaching slowly, etc.

4. Can the client estimate the path of travel of the vehicle relative to his/her body? i.e., parallel, perpendicular, angling towards or away from the client?

5. At night, do headlights on vehicles interfere with and effect judgments?

IV. FUNCTIONAL VISION ASSESSMENT -- PUBLIC TRANSPORTATION

A. Bus Travel:

1. Does the client locate the bus stop easily? What clues are used to locate the stop?

2. Is the client able to identify the correct bus by

   a. certain color?
   b. destination sign (include with and without a low vision aid, if used)?

3. When client boards bus, does he/she

   a. negotiate doors and stairs well?
   b. place fare correctly?

4. Can client find seat or standing place visually?

5. Can client visually determine where he/she should exit? Evaluate on familiar and unfamiliar bus routes.

B. Subway Travel:

Note that adaptation feature of moving from brightly lit areas (e.g., outdoors) to dimlit areas (e.g., subway stations) and vice versa may interfere with functioning. Client may be advised to wait a few minutes for eyes to adjust before continuing.

1. Can client locate the subway station?

2. Can client negotiate stairs into station and inside station visually?

3. Is client able to visually locate:

   a. token booth and appropriate window?

IV. B. 3.

   b. turnstile and token slot?
   c. exit doors both revolving and swing doors?

4. On subway platform:

   a. can client determine width of platform?
   b. can client locate platform edge?
   c. can client determine whether the platform is single or double edged?
   d. does he/she move along middle of platform or "hug" edge?
   e. is he/she able to read signs on subway platform?

5. Is client able to read destination letters and signs on trains?

6. Is client visually able to locate subway door

   a. while train is moving?
   b. before/after doors open?
   c. both inside and outside of subway car?

7. Does client enter train easily?

8. Once entering train, is client able to locate a seat or pole to stand against?

9. Is client visually able to determine when to exit train at appropriate subway stop?

10. After exiting subway car, is client able to orient himself/herself on platform to determine which way to exit station, locate transfer path, etc.?

*****

GJZ/sr

Outline: Spatial Orientation

1. Space, Spatial Relations, Orientation
    a. definitions
    b. schools of thought relating to the learning of space and spatial relationships
    c. postural orientation, locomotor orientation, geographical orientation:
        1. are these the same? different? how?
        2. influence on process of transfer
2. Multi-sensory Approach to Presentation and Experience
    a. consider the relevance to the process of orientation of the materials included in
        1. Concept Formation-body schema; continuity; closure; order
        2. Motor-Kinesthetic System-veer; turn; etc.
        3. Low Vision-clarity; incompleteness; depth, etc.
        4. Auditory System; localization; tracing; etc.
        5. Tactual Haptic System perspective; integration; projection; etc.
    b. consider influence of: parts to whole, whole to parts, etc.
3. General Factors
    a. fields (levels) of space experience
        1. immediate (body)
        2. near
        3. mid
        4. far
    b. consider the experience of and the influence of a temporal sequence vs. a spatial context
    c. building of a reference system
4. Experiences in Spatial Organization-Orientation
    a. consideration regarding sequence
        1. assisted-unassisted
        2. simple-complex
        3. small-large
        4. near-far
        5. with and without sound or other clues
        6. with and without distraction
        7. in and out of doors
        8. "controlled" to "real" environment
    b. simulate patterns of movement
        1. student stationary-instructor moving
        2. instructor stationary-student moving
        3. single level-multi level
    c. relevance of landmarks (checkpoints)
    d. use of a maze; use of an obstacle course

    Aids: rope patterns, foot paths, sound (front, back, sides, around, sizes, etc.) tactual and visual maps, etc.
5. Relevance of above to
    a. process of being familiarized/oriented by another
    b. process of self familiarization/orientation including re-orientation
    c. partially sighted person

Note: client usually needs assistance in developing a system of investigation and in synthesizing data.

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Outline: Concept Formation

The following are several major areas to consider when a Peripatologist is involved with the process of concept formation (also note attached "Concept Development")

1. What is a concept?
    a. definition
    b. analysis of a concept (objective factors) vs. learning of a concept (subjective factors)
2. Concept Groups
    a. body image: composite vs. parts; triordinate system; function; etc.
    b. line/plane; types, extension/continuity; etc. (apply to body, space and objects)
    c. shape/form; outline; 2D, 3D. (apply to body, space and objects)
    d. spatial organization: position, location, etc.; order/sequence; near-mid-far space, "extension" of body schema, etc. (apply to body, space and objects)
    e. temporal: time distance relationship; division of day, season, etc.
    f. envrionmental objects and arrangements
        1) major characteristics of an object: sensory-physical, spatial structural, function-use.
3. Tactual-Motor factors to consider in the attaining of concepts (see "Tactual-Haptic System)
    a. Importance of Multi-sensory channel presentation to and response by the client
4. Program
    a. Which concepts to include?
    b. When? consider developmental-sequential factors and pre-school, elementary, secondary school contexts
5. Influence of Language Development on the Process of Concept Formation
6. What Aids are Applicable to learning of concepts?
7. Role/responsibility of Peripatologist: Primary? Supportive? Both?

NOTES:

1. Consider appropriateness and implementation of the following continuums:
    a. assisted/guided awareness-identification, recognition, discrimination, reproduction (tactual, locomotor, etc.), association, search for recognition in environment (familiar and unfamiliar)
    b. motor-sensory to perception to symbolization to abstraction to generalization-conceptualization
    c. homologous, lateral, cross lateral
    d. concerning integrating self with environment
        1. body schema (parts/planes-discrete and related, laterality, triordinate system, directionality)
        2. object awareness identification, to
        3. relating specified body segments with an object
        4. relating specified object segments with self
        5. relating body with object/area with both having specified segments

    e. uni-directional to multi-directional (perspective)
    f. fixed to moving for student and environment separately and together
    g. opposites to perpendicular
    h. globular (general awareness-identification) to parts (analysis) to composite (synthesis-integration)
2. It seems to be helpful to focus on selective concepts (e.g. one or two at a time), implement the concept to self, object, mid-far space and apply to practical situations rather than an approach such as a "check list".
3. Something is (exists) and remains (object permanence-constancy); it is a separate but related unity and has a place.

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George Zimmerman (1982)

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Parent/teacher Guides

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    a. "Directory of Agencies Serving the Visually Handicapped in the United States."
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    c. "A Step-by-Step Guide to Personal Management for Blind Persons," 1970.
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    a. Halliday, C.; "The Visually Impaired Child's Growth, Learning, Development - Infancy to School Age," March 1970
    b. Hapier, G.D.: Weishahn, M.W.; "Handbook for Teachers of the Visually Handicapped," Sept. 1970/1981.
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4. Angus, H.D. (et.al.); Twenty Questions About Mobility, New Outlook (Sept. 1969)
5. Barry, M.A., How to Play with Your Partially Seeing Pre-School Child, New Outlook (Dec. 1973)
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    (2) "Developmental Sequences of Perceptual-Motor Tasks," 1967.
b. Geiger, J.D., Christaldi, J., "Postural Improvement Activites for All Ages," (Album 4 records)
c. Draley, W.T. (et.al.) "Daily Sensori-Motor Training Activities 1968.
d. Movement Fun - P. Smith
e. Coordinated Skills - H. Hissam
f. Getting to Know Myself - H. Palmer
g. Creative Movement and Rythmic Exploration - H. Palmer

16. Farina, E.M. (et.al.): Growth Through Play (N.J.: Prentic Hall) 1959.
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20. Henderson, L.T.; Opening Doors, My Child's First Eight Years Without Sight, (N.Y.: John Day Co.) 1954.
21. Hill, E.w.; The Formation of Concepts Involved in Body Position in Space, Education of the Visually Handicapped, (Dec. 1970/ March 1971/1981)
22. How does a Blind Person Get Around, (N.Y.: Am. Founda. for the Blind) Sept. 1973.
23. Illinois Department of Children and Family Services;
    a. "Orientation and Mobility for the Visually Handicapped" (guide for parents)
       Note: This item has been Reprinted by Albany Assoc. of the Blind, New York.
    b. "Questions Asked by Parents of Visually Handicapped Children" (Guide for Physicians).
    c. "Mobility Training for the Visually Handicapped" (guide for teachers).
       Note: This item has been Reprinted by Albany Assoc. of the Blind, New York.
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    b. Griffin, C., Esche, J.: "A Handbook for Parents of Deaf-Blind Children", 1971.
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32. New York Association for the Blind, Understanding Your Blind Child May 1959.
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    b. "Concept Development - A Guide for Elementary School Teachers 1970. (Available through Amer. Foundation for the Blind).
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B. The following are Audio-Visual Aids that might be utilized for Community Education, in-service etc.

1. "The World of Deaf-Blind Children - How They Communicate" Perkins School for the Blind, Topic: communication

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3. "Realities of Blindness", Perkins School for the Blind. Topic: content of School program including mobility.

4. "May I Help You," Western Michigan University. Topic: demonstrates the road to the rehabilitation of an adventitiously blinded adult.

5. "From Here to There" University of California Extension Media Center. Topic: orientation and mobility skills of blind children through high school.

6. "Bus Travel - Orientation and Mobility," Alameda County School Department, California, Topic: demonstrates orientation and mobility skills related to bus travel for congenitally blind adolescents.

7. "The Low Vision Patient," N.Y. Assoc. for the Blind, Topic: Examination of the patients at the Light House Low Vision Clinic.

8. "The Long Cane," U.S. Veterans Administration (1954). Topic: general and specific techniques/problems in foot travel; Rehabilitation process.

9. "Out of Left Field": Am. Founda. for the Blind. Topic: problems and solutions of integrating visually impaired youths into sighted community, recreational and social activities.

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11. The Seeing Eye, Inc.: filsm available portraying methods used in training dogs, teaching blind persons the use of a dog as a guide.

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1. The Exceptional Parent, Box 45 Newtonville, MA 02160.

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3. Awareness, 2011 Hardy Circly, Austin, Texas, 78757.

APPENDIX D LEARNING STYLES/EXPERIENCES

DESIGN OF AN EARLY LEARNING CURRICULUM

Lauren B. Resnick
University of Pittsburgh

With all the current discussion of the need for beginning education early, there has been astonishingly little systematic attention to the question of what the content of that education ought to be. There is plenty of debate over whether young children should be offered conceptually oriented formal instruction of any kind, and whether the classroom organization should be free and expressive or structured and directed. Yet, with few exceptions, even those committed to early conceptual instruction offer no clear specification of curricula or rationale for curricular choices.

One possibility for early learning programs is that they simply begin instruction in the standard curriculum at a young age and thus make it likely that pupils will enter the first grade "advanced" in reading, arithmetic and related subjects. There can be little doubt that such an early start is possible, at least with some pupils, when the eudcational methods used are appropriate to the learning requirements of young children. This has been demonstrated in a number of settings, perhaps the best known of which are O.K. Moore's Responsive Environments Project (Moore & Anderson, 1968) and the many Montessori schools in this country and abroad. However, closer examination of most of these programs reveals that, in addition to the traditional "subjects", there is a whole series of preparatory skills and concepts which are also taught, if only implicitly. These preparatory behaviors, which are essential to subsequent learning, can well command primary attention in a systematic attempt to develop an early learning program.

Need For An Early Learning Program

The child from an educated family who enters school at the age of six, even if his parents have made no conscious effort to teach him, has behind him a learning history of considerable richness and complexity. As a result of his interaction with his environment, he has a perceptual discrimination repertoire that allows him to efficiently scan and categorize new visual stimuli. He has reasonably well-organized spatial and temporal concepts which permit him to locate objects and events in time and space and to orient himself with respect to them. He is fairly good at recognizing relevant aspects of a learning situation and focusing his attention on them. He can talk comfortably with adults and has a linguistic competence that allows him to learn from verbal exposure. He can use examples as a way of learning new concepts and can ask questions to gather new information, and so forth... The list of skills and concepts which constitute a well-endowed six-year-old's "readiness" for school would read like a catalogue of aptitude and intelligence measures. Yet the child was born with none of these specific abilities. In interaction with his environment he has learned them all.

Design of an early learning curriculum..............................

Can an environment be created that will maximize the learning abilities of children from all kinds of home backgrounds? Herein lies the great challenge for early education. A few children learn from their families, or other interested adults, a whole range of specific abilities and learning sets that facilitate subsequent learning. These are the children whose scores on tests suggest that they are "intelligent" and whose performance in school normally confirms the appropriateness of the label. Yet what these children learn incidentally, almost by accident, the majority of children will learn only if they are systematically taught. Where the unprogrammed environment of the home and neighborhood does a weak or incomplete job, a "programmed" environment, designed for the pre-school, offers the best hope of providing the necessary experiences. This planned environment must be highly efficient in promoting learning, for the child will spend only a tiny fraction of his time during his pre-school years in classes of any kind. With so little time available, it is highly unlikely that a school environment which merely reproduces the unprogrammed qualities of the educated home will succeed in establishing the necessary skills.

The need, then, is to design an early learning program that is explicitly intended to teach children how to learn and how to think--in other words, to teach them the skills and concepts that underlie intelligent behavior. Such a program would represent a logical application of current theories which view intelligence as learned and responsive to experience rather than inherited an fixed (Hune, 1961). This certainly does not mean, however, that children should be artificially "coached" to do well on standard intelligence tests. Such coaching usually has the effect of raising test scores, but not of generalizing to new learning situations. If an early learning program is ultimately to be counted successful, then instruction in the skills identified must not only lead to improved performance on intelligence tests; the increased intelligence scores must continue to be predictive of increased learning power, in school and elsewhere.

Content of an Early Learning Program

Extensive study, both analytic and empirical, will be required to determine exactly which skills and concepts, systematically taught in the pre-school, will produce the kind of generalized learning power under consideration here. Initially, hypotheses concerning the probable range and character of the curriculum can be derived from a variety of sources. The literature in developmental cognitive psychology, while not pedagogically oriented, is rich in suggestions for curriculum development. Thus, several of the skill sequences discussed later in this paper draw heavily on the work of Piaget, Bruner and their followers. Further suggestions come from educators and psychologists working with retarded and otherwise handicapped children. Perhaps because the children they work with do not learn easily from casual and unplanned exposure, investigators in the fields of "special education" had had to pay closer than ordinary attention to the details of curriculum and instructional strategy, particularly in basic areas. Still other skills under consideration derive from our own observation and analysis of children's learning, both in the laboratory and in school settings.

From these sources, three general classes of skills can be identified for inclusion in an early learning curriculum. These can be termed: (1) orienting and attending skills, (2) perceptual and motor skills, and (3) conceptual and linguistic skills. Each of these categories is discussed in the paragraphs below, and illustrative lists of skills for each class appear in Appendix A.

(1) Orienting and attending skills include the ability to concentrate on a task and resist distractions; the ability to attend to appropriate details; to follow directions; to accept rewards which are delayed rather than immediate, and verbal rather than concrete. Other examples of this class of skills appear in Section I of Appendix A (page 21). These are the kinds of skills that permit a child to function well in a classroom and to learn from the environment. In that sense, they are prerequisite to all of the other skills in an early learning curriculum. For some children a relatively long period of attention to these orienting and attending skills alone may be required (e.g., Berman, 1967) In any case, a pre-school program which ignores the need to develop and nurture these adaptive behaviors will almost certainly fail in its attempt to develop higher-order skills and concepts for all children.

(2) Perceptual-motor skills, which similarly underlie higher-order conceptual functioning, include the ability to use one's body efficiently, with awareness of its position in space, and the ability to make a wide range of sensory discriminations. These skills are listed in Section 2 through 5 of Appendix A (pages 25-31). Both gross motor skills, such as are needed for controlling one's movement through space, and fine motor skills, such as fitting, placing, and using writing instruments are included. In addition, there is a set of "positioning" skills, including the left-right discrimination and movement in specified directions, all of which are prerequisite to the development of more complex spatial concepts. Finally, sensory skills compromise a range of visual, auditory, and haptic perception and discrimination behaviors. These are virtually synonymous with the child's earliest concepts. As he learns to discriminate, sort, and eventually label shapes, colors, sizes, and sounds, the child is learning elementary concepts that are later elaborated and combined in complex ways. In addition, particularly when systematic instruction highlights the processes, he learns methods for organizing and making sense out of the often confusing sensory stimulation his environment offers.

(3) The conceptual-linguistic category includes behaviors such as classification, reasoning, spatial relations, plan following, and memory, together with the language facility that supports and gives expression to competence in these areas. Early mathematical concepts and processes are also included in this category. Lists of these skills appear in Sections 6 through 16 of Appendix A (pages 32-48). Compared with motor and perceptual skills are still relatively undeveloped as targets of early instruction. Psychologists interested in cognitive and linguistic development, who have studied some of these concepts and skills in great detail, have been mainly concerned with describing the behaviors involved and identifying stages of cognitive development through which children pass "naturally". There have

been relatively few investigations of the effects of direct intervention on this development, particularly of sustained and systematic instruction. On the other hand, most pre-school projects, which are concerned with intervention--often long-term-- have addressed themselves to isolated pieces of conceptual and language behavior, without analyzing the entire range of such skills and preparing a carefully sequenced curriculum based on that analysis. Thus, the task of analyzing and sequencing a broad range of conceptual and language objectives for young shildren constitutes a research undertaking of major dimensions and importance.

CONCEPT DEVELOPMENT

I. Preliminary Considerations
  A. LEARNING
    1. Goals of Learning
      a. acquisition of skills: sensori-motor modification and control
        (1) should begin in youth for greater permanence and excellence
      b. acquisition of knowledge (understanding): intellectual modification and control
        (1) perceptual learning and problem solving ability-these processes favor a "mature" person because of his greater apperceptive background.
    2. Memory - whatever is thoroughly learned and used at intervals is remembered.
      a. tendency to recall past experiences because
        (1) similar to present - law of similarity
        (2) contrast with present - law of conrast
        (3) connected with present in space or time sequence -law of contiguity
        (4) laws of recency, vividness and frequency
    3. Processes used by an individual when presented with information
      a. cognition - awareness and understanding of data being presented
      b. memory - recognition, retention, recall
      c. convergent thinking - use of cognition and memory to arrive at an "only one right answer"
      d. divergent thinking - working from a fact and considering what the possible effects could be
      e. evaluative thinking - judgement in terms of value, validity, etc.

  B. CONCEPT DEVELOPMENT
    1. Concepts are acquired through a complex set of processes:
      a. one learns that objects exist, have permanence and differ one from the other
      b. identification and subsequent naming follow
      c. one must learn not only to identify the whole object but also to define its characteristics
      d. when an individual can abstract a common element from several sensory experiences and uses this astraction as definition of a class and, when he can represent this generalization by a symbol - he has formed a concept. Before it is fully established its validity must be tested by behavior predicated upon it. Such testing will lead to acceptance, modification, rejection.
    2. Three levels of concept development:
      a. concrete level - specific characteristic is considered to be the content
      b. functional level - what "it" does or what one does with it
      c. abstract level - summarization of all the essential characteristics of the object

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19. Piaget: a concept (or classification) is not a mere task of labeling of a set of stimuli; it is an actual imaginative "piling together" of objects included in the class.

20. According to some theories, language is the key determinant of the developmental sequence of concept attainment. It determines how the environment is discriminated, what objects can be integrated and what kinds of abstract concepts can be invoked.

21. Comments concerning some common concepts:
    a. object permanence - by 18-24 months, a child realizes objects have substance, take up space and are permanent (exists when out of sight). At first the child views objects as an extension of himself; if the object is out of sight he does not seek to locate it because he presumably believes it no longer exists. This is followed by active searching (first randomly, then specifically) for items out of sight.
    b. Space and spatial relations (concomitant with concept of "object permanence")- generally the sequence is:
        (1) unrelated separate spaces
        (2) near space perceived in the realm of objects to be grasped
        (3) differentiation of subjective and objective space (relationship of self to object)
        (4) increase in understanding of relationship of objects in and of themselves and between each other

Note: Piaget categorized space as follows (educational systems usually teach these in reverse order):
(1) topological - refers to continuity, enclosure, order. This becomes stable by seven year of age.
(2) projective - refers to object constancy. About 9-10 years old a child is able to handle.
(3) Euclidean - refers to such factors as angularity, parallelism.

    c. Form - at preverbal period children begin to show generalization ability and skill in differentiation.
    d. Size -
        (1) concept of relative size seems difficult to learn- apparently because the child must be able to abstract the size and see its relativity; this requires the ability to conserve and to relate.
        (2) once a child learns to discriminate differences of a wide range (by 4-7 years of age) he can begin to generalize to narrower ones.
    e. Quantity, Weight, Volume - findings point to steady improvement with age but provide little regarding developmental levels. There is indication, however, of the following order: quantity by 7-8, weight by 9-10, volume by 11-12.

f. Causality

- (1) Suggested stages:
  - (a) realism - until 2-3 years old; confuses objective and subjective reality
  - (b) animism - 2-3 to 7-8 years old; attributes life to inanimate objects
  - (c) logical and real categories - beyond 8-9 years old.
- (2) "Processes" rather than "stages"
  - (a) phenoministic causality - prevalent at 8 with a steady decline to 15: two facts appearing together are perceived as related because they appear together.
  - (b) dynamic causality - occasionally evident 8-16 but apparently no focal period: objects are seen to have inherent forces which explain their activity and movement
  - (c) mechanical causality - explanation by contact rather than internal force (e.g. - peddles make bicycle go)
  - (d) logical deduction - increases with age, peak at 16: explanation based on principles.

II. Developmental Periods (for "normal" sighted child)

0 - 2 years

"growth and working control of own body"

Physical Development	rapid growth
Sense - organ development	all senses acute
Nervous system	rapid development; 3/4 of adult brain weight by two years
Muscle-motor control	-consider law of developmental direction -walking with rudimentary running (stiffly upright), jumping, skipping, climbing; up and down stairs using rail (two feet on same step); pushes/pulls large toys
Speech development	-pre-speech forms -until 18 months words must be reinforced with gestures -6-120 word vocabulary - mostly nouns and verbs -shows and repeats parts of body, clothing -constantly asking names of object
Intellectual Behavior	-most are percepts -by end of second year, simple generalizations based on similar experiences in which he has observed relationships -Piaget's Sensori-Motor Period - activities and attention dominated by external stimuli. The world is not experienced as in integrated unit but as a series of stills 0-1 month - reflexive behavior 1-4 months - reflex action becomes modified and coordinated 4-8 months - begins to act toward

	environment as though it has some permanence and stability; begins to demonstrate intention 8-12 months - repeats patterns of behavior; tends to use what he has learned in search of objects 12-18 months - begins to experiment 18-24 months - shows capacity for primitive symbolic representation

2 - 6 years
"exploration and control of his environment"

Physical development	relatively even growth - generally a proportioning and hardening process
Sense-organ development	remain acute
Nervous system	relatively even development
Muscle-motor control	-critical age -hand skills being developed (throw, catch, selfcare) -likes to march to music; hop; skip; jump; balance; dance; can button -by 3: upstairs with alternate feet, down stairs with 2 feet on step; walk on tip toe; stand momentarily on one foot -by 4: up and down stairs alone with alternate feet; hop on one foot; climb ladders, trees, etc. -by 4-5: can copy square, circle, triangle letters (V,T,H,A,L,W,Y,O,F,U) -by 5: skips; can stand on one foot for 8-10 seconds
Speech development	-critical period -pronouns, verbs, adjectives increase

-ability to comprehend meaning develops rapidly (through word and gesture)
-by 4-5: asks meaning of abstract words

Intellectual

-concept formation advances rapidly; still perceives wholes rather than parts
-minimum interest in symbols
-2-4 years - many questions of what, where, who
-4 years on - many questions of why, how, when
-can note differences in materials; by 6, common forms
-concepts (animism):
self - knows parts of body, right/left, boy/girl
weight - confusion of size and weight
form - develops gradually
relative size - by 3 years, largest/smallest
by 5 years, mid sizes
space - short distances (studies these in relation to body)

-Piaget:

1. pre-operational (ages 2-4)
    a. conceptualizes on single salient feature of environment (unable to handle multiple characteristics of object)
    b. judges on face value; uses self as standard
    c. still perceptually dominant but can approach on a rudimentary representataional basis rather than through direct motoric action
2. intuitive (ages 4-7)
    a. still dominated by perception but increased symbolic functioning
    b. three fundamental operations make their appearnace
        (1) ability to think in terms of classes
        (2) ability to see relationships
        (3) ability to handle number concepts

6 -12 years
"gang age"; "play age"

Physical development	-slow and relatively uniform growth -child is interestd in what goes on inside
Muscle-motor development	-willing to practice endlessly -virtually all self help, social and play skills are being worked on 1. rhythmic activity - likes to march to music, dance, sing 2. group games - simple ball games; giant steps; London bridge 3. basic activities a. locomotor movement - improving control of speed; walking; running; skipping; jumping b. posture - bean bag, balance beam c. basic motor ability skills - clap hands, throwing, kicking, climbing, pointing fingers d. exploration through movement
Speech development	-slang age -discovers speech as an important tool for group belonging; transition from egocentric to socialized speech -by third/fourth grade can verbalize ideas and problems -vocabulary: approximately 20,000 words for first grader approximately 50,000 words for sixth grader
Intellectual development	-Piaget: Concrete operations (ages 7-11) 1. reasoning process begins to appear logical 2. intense intellectual and conceptual growth 3. "operations" in this stage a. classification - grouping of diverse items b. seriation - ability to arrange items in order c. conservation - changes do not necessarily alter essential properties of subject

-errors in concepts are frequent due to lack of adequate information to act as critical check on the formation of concepts

-concepts: are less vague and more meaningful self- interplay among students, teachers and classmates help see "self"

distance - inches, feet, yards, miles (through arithmetic classes)

quantity - weight (ounces, pounds); number (use of money)

time - schedule of school day and geography classes offer appreciation of this transition from animism but still some confusion of "living" and "has life"

-by 6 years: can reason through simple mazes

-by 7 years: rudimentary comprehension of time

-by 8 years: concept of 1/4 and 1/2 clear; beginning of cause and effect

-by 9 years: auditory memory well established slow progress with generalizations attention span increased ability to plan

-by 10 years: emergence of independent critical thinking

-by 11 years: transition from concrete to abstract thinking well marked; increased ability to make associations, comparisons, estimates

-by 12 years: able to analyze a situation verbally and symbolically.

A. During the later part of the 6-12 year period the developmental stage of puberty (10/12 - 13/14 years) becomes evident with its rapid physical and psychological changes. These lead to confusion; feeling of insecurity; anti attitudes; fatigue; listlessness; temporary retardation in coordination, balance and agility; restlessness; boredom; demand for independence and resistance to authority.

Piaget's periods of "Formal Operations" (11-15 years) straddles the completion of elementary grades and the beginning of secondary grades. Two significant factors to consider in the personal intellectual development are: 1) able to handle multiple variables at one time 2) able to make inferences and evaluate hypotheses.

B. Considerations for secondary school studets (12/14 - 17/18 years of age) - generally the developmental factors to consider are:

1. there is much internal growth - change in relative size of organs of digestive system, increase in size of circulatory system, imbalance of whole endocrine system
2. rapid growth in muscle and bones result in awkwardness
3. muscular fatigue results in listlessness
4. much natural curiosity suppressed by environmental restraints.

III. Integration of Orientation and Mobility with School Curriculum

The following is a listing of factors included in the curriculum of a residential school. These factors could be useful for the planning of orientation and mobility activities.

K - auditory readiness: learning to listen - reproduction of sounds, discriminate among various sounds
  tactual readiness: through the use of blocks, beads, pegs, etc., patterns are learned that will later represent Braille letter combinations
  arithmetic: emphasis on language - words denoting relationships, quantity, relativity

Gr1- arithmetic: addition and subtraction
  social studies: traffic rules (stop and go)
  physical education: rhythm band
  Braille Writer readiness: exercises to strengthen fingers

Gr2- arithmetic: multiplication; work units on clocks, rulers, money
  social studies: different means of communication; preparation for a trip; map making in conjunction with a trip
  science and safety: seasons, air/water, heat, sound, how toys work, safety in neighborhood

Gr3- arithmetic: division
  social studies: where we live, what a town does for its inhabitants
  science and safety: earth, sky, seasonal changes, magnets, electricity, safety in play and community

Gr4, 5, 6 -
  arithmetic: measurement, graphs
  social studies: use of models in museum, field trips, map work - braille outline maps, contour maps, relief maps, puzzle maps, globe, use of plasticene to make own maps
  science and safety: sound, light, safety at home and school
  industrial arts: crafts, sewing

Gr7- social studies: map work
  science: nature of materials
  arithmetic: word problems

Gr8- arithmetic: area of rectangle, square; volume
  physiology: study of structure and function of human body
  social studies: geography of U.S.

Jr. High -
  mathematic: plane geometry
  general science: survey of 14 areas - heat, sound, weather, etc.
  physics: matter, energy, etc.
  social studies: use of leisure time

Note: should be aware of specific physical education activities at each level.

ANDRAGOGY

Subject: ANDRAGOGY - the art and science of "helping adults learn"

The following includes excerpts from and paraphrasing of the work of John D. Ingalls in "A Trainers Guide to Andragogy." These statements might assist you in thinking about and applying the principles of learning as indicated in typical education courses.

> "most of what is known about learning has been derived from studies of learning in children and animals. Most of what is known about teaching has been derived from experience with teaching children under conditions of compulsory education. And most theories about the learning/teaching transaction are based on the definition of education as a process of transmitting the culture."

Professor Malcolm S. Knowles of Boston University has identified four criteria that have impact on the learning process for adults. He does not suggest any fundamental difference between the way adults and children learn (i.e., internalize new information) but he does point to differences that stem from the conditions surrounding adult and child learning and differences that emerge in the learning process as various degrees of maturation emerge.

1. Self Concept of the Learner

   The self-concept of a child is that of being a dependent person. As children move toward adulthood, they become increasingly aware of being capable of making decisions for themselves. At the same time, they experience a deep need for others to see them as being capable of self-directon.

   The first major difference between Andragogy and Pedagogy exists in the relationship between teacher and learner and in the learner's concept of himself with regard to his capacity for self-direction.

   a. Dominant Teacher - Dependent Learner = A Directing Relationship (Pedagogy)
   b. Reciprocity in the Teaching/Learning Transaction = A helping Relationship (Andragogy)

2. Experience

   Adults have accumulated vast quantities of experience of differing kinds. Children on the other hand are relatively new to experience; experience is what happens to them. Many patterns of experience have not occurred frequently enough for them to have become familiar, safe or predictable.

   The second major difference between Andragogy and Pedagogy exists in the direction of communication and the role of experience in the learning process.

   a. One way communication given by teacher to learner; experience of the teacher valued as the primary resource for learning (Pedagogy)
   b. Multicommunication shared by all; experience of all valued as resources for learning (Andragogy).

3. Readiness to Learn

Educators are quite familiar with the concept "readiness to learn" and "teachable moment." The main task of pedagogical curriculum development lies in dealing with sequencing and interrelating of subjects and skill building activities to meet the requirements of competency for graduation. The development tasks for adults however are increasingly related to the social roles that form their immediate concerns, i.e., working, raising a family, recreational activities, etc. The adult experiences many "teachable moments" called forth by the needs of their social situation.

The third difference between Andragogy and Pedagogy exists in the factor of who chooses content (what will be learned) and who assumes responsibility of choosing how and when learning will take place.

a. Learners are grouped by grade and class; teacher makes curriculum decisions for learner. (Pedagogy)
b. Learners group themselves according to interests: facilitator helps learners to diagnose learning needs. (Andragogy)

4. Time Perspective and Orientation to Learning

We are used to thinking of education in terms of "preparation for the future" rather than "doing in the present"; teachers present information neatly packaged into subjects.

The fourth difference between Andragogy and Pedagogy can be inferred from the phrases "problem centered" and "subject centered."

a. Teachers as curators of knowledge of the past; grouping and classifying information into subjects to be studied now for use "someday". (Pedagogy)
b. Problem finding/problem solving teams; team is oriented toward the discovery of an improvable situation, a desired goal, a corrective experience, a developmental possibility in relation to the reality of the present situation. (Andragogy)

Two clarification to be made are:

1. Developments in childrens' education in recent years have tended to make it more "andragogical"; i.e., use of experiential learning techniques, recognition of cultural and ethnic differences.
2. The andragogical approach by concentrating on "here and now" does not imply devaluing the past. It is suggested that adults are much more likely to be motivated when they have a "need to know" as a result of experiencing a present problem situation of learning need.

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CONSIDERATIONS IN FORMULATION OF LEARNING EXPERIENCES

A. Lesson Planning Observation
  1. Content (what?) context (where? when? who?) capacity, ability, needs, etc.
     Methodology/procedure (how?)
     Rationale (why?)
  2. What are the experiential components of lesson? (environmental, conceptual, perceptual)
  3. Implementation of behavioral objectives and, when appropriate, method vs. skill (technique) per se.
  4. Presentation--multi channel approach to presenting information and student response (verbal and non-verbal--tactual, motor, auditory, etc.)
  5. When possible, self-checking system by blind person.
  6. Evaluation
     a. techniques, motor behavior, sensory awareness/use, spatial orientation, concepts; emotional-attitudinal factors, etc.
     b. consider "differential diagnosis" (teacher variables, student variables, environmental variables)
     c. what and how to correct student? when? how much?
     d. important to reflect on instructor's performance-did-didn't it work? (what? how? why?)

NOTES:
A. 1. consider appropriateness of
     a. place (1) of experience (2) in "program"
     b. time (1) of day (2) invested in lesson
     c. amount (1) presented (2) of experience
  2. consider the following progressions
     a. assisted-unassisted
     b. short-long
     c. simple-complex
     d. familiar-unfamiliar
     e. being familiarized - self familiarization
     f. directions by "informed" and "uninformed" individual
  3. learning process involves: "doing", "guided discovery", active inquiry by student, problem oriented instruction
  4. offer applications to daily activities
  5. involve family, teachers, etc.

B. Route Planning
  1. Sensory Information
     a. available - amount, affect of weather factors (seasons, etc.), affect of health factors
     b. usefulness of - clarity, distraction, masking, blocking
  2. Pattern
     a. simple-short distance, uni-directional
     b. difficult - increase distance and obstacles
     c. complex - multi-directional (reverse and alternate routes, regular/irregular)
  3. Risks
     number and type; e.g., street crossings, stairs, protective shorelines, etc.

NOTES:

1. what environmental components to include; e.g., driveways, shorelines, crossings, etc.
2. simple trip - primarily for introduction and practice
   familiar area - primarily for introduction, practice, extending effort and attention, helping student integrate and prepare for transfer
   unfamiliar area - primarily for application, interpretive process and transfer

consider routes that are longer, shorter, easiest, more difficult, safest, quickest-slowest

4. consider following progression: walk through to verbalization of entire route to verbalization of part of route with student completing to verbalization of objectives and student plan route(s)
5. problem solving experiences ("drop off")

PROCESS VS. PRODUCT

A. Input: Acuity, Attending

Factors influencing input
physical, neuro-physiological, sensory
psychological
environmental

B. Processing:

1. Cognitive Operations:

- perceiving
- discriminating
- abstracting
- generalizing
- remembering
- evaluating
- imagining
- problem solving
- creativeness
- thinking
- integrating

2. Psychomotor Operations:

- bilaterality
- balance
- strength
- speed
- impulsion
- precision (efficiency)
- coordination (rhythm)
- flexibility
- endurance

C. Achievement/Performance:

awareness - level of: how much/how complex?
understanding
implementation: range, effective, efficient, autonomy

PRINCIPLES OF LEARNING/TEACHING A PSYCHOMOTOR SKILL

1. analyze skill before attempting to guide learner
2. demonstrate correct response
3. guide initial responses-verbally and/or physically
4. provide for appropriate practice tasks-include mental involvement
5. distribute rather than mass practice
6. provide knowledge of results and correct inadequate response
7. aid learner to evaluate responses

PRINCIPLES FOR FACILITATING THE LEARNING OF CONCEPTS

1. organize concepts into appropriate learning units
2. encourage and guide searching behavior
3. organize realistic experiences with concept
4. give concise, clear meanings of the concept
5. provide for application of the concept
6. aid learner to evaluate the adequacy of concept

PRINCIPLES FOR IMPROVING PROBLEM SOLVING

1. activate solvable problems in the learning situation
2. assist learner to state and delimit the problem
3. assist learner in finding needed information and method
4. aid learner in interpreting and analyzing information and method
5. provide opportunity for stating and testing hypothesis
6. encourage independent discovery and evaluation

PROBLEM SOLVING EXPERIENCES

Comments Concerning "Exploration", "Drop-Off" Type Assignment

A. Attempt is made to learn of:
  1. Input: the amount and expense of awareness
  2. Processing:
     a. ability to identify
     b. level of discrimination
     c. accuracy of interpretation
     d. ability to selectively attend
     e. associative ability
     f. analyze, synthesize, integrate: gather and order the input meaningfully and appropriately
  3. Output: behavior planned movement; space structured behavior

  NOTE: see attached "Process vs. Produce"

The above type of assignment and performance factors could be utilized for each and every unit of the program, perhaps more than once. The above list is also relevant to exploration of an object.

B. System of Inquiry/Search
  1. develop appropriate and orderly search/questioning of environment and public.
  2. Consider: common properties, predictable chracteristics, probabilities

C. Consider Such Tasks in:
  1. limited area - e.g. driveway, front walk, room, one floor or small area of a building (familiar and unfamiliar area)
  2. Conventional drop off - familiar area
  3. Exploration type lesson - unfamiliar area

APPENDIX E: ENVIRONMENTS

ANALYSIS OF SHOPPING MALLS FOR THE PURPOSE OF ORIENTATION AND MOBILITY INSTRUCTION

In partial fulfillment of course
requirements for ED 585
Seminar in Peripatology
Submitted by: Sarah Stanton
Advisor: Michael Herron
April, 1979

Table of Contents

Introduction; description of analysis 1

Introductory steps 3

Step I CONSIDERATIONS OF THE CLIENT 6

- A. Motivation
- B. Evaluation of sensory systems
- C. Functional ability of sensory systems
- D. Previous training
- E. Travel ability
- F. Special considerations

Step II TEACHING CONSIDERATIONS 8

- A. Considerations of the client
- B. Considerations for the instructor

Step III GENERAL ANALYSIS 9

- A. Conditions of travel to/from the mall
  - 1. available transportation, Items under analysis
  - 2. From drop-off point to mall entrance, Items under analysis
    - -sensory
    - -physical and spatial
    - -special conditions

- B. Conditions of travel in the mall 10
  - 1. General layout, Items under analysis
  - 2. General characteirstics, Items under analysis
    - -sensory
    - -physical and spatial
    - -special conditions

Step IV. SPECIFIC ANALYSIS 12

- A. Modes of travel to/from the mall, Items under analysis
  - 1. Transportation
  - 2. Identify/locate characteristics

- B. Modes of Travel in the mall, Items under analysis
  - 1. Specific layout
  - 2. Special Characteristics for client's use
  - 3. Special considerations

Shopping malls are becoming the most common and convenient areas in which to do business. Their number is increasing and they are becoming more complex. In order to attract many shoppers to one area, shopping plazas were first developed. During the 1950's rows of stores were constructed, combining a variety of businesses in a convenient location on the perimeter of a parking lot. These plazas attempted to remove the shopping business and traffic from the town center.

Later in the 1960's some of the plazas were enlarged and a common roof was used to connect the stores. Many of the larger malls in the Boston area were constructed this way. To stagger the construction costs, time and secure the productivity of the shopping area, the mall was initially constructed as a shopping plaza. Gradually changes were made to develop the plaza into an enclosed shopping mall.

Within the Route 128 circumference of Boston there are more than 25 shopping malls. Located near the major roads and highways, most are easily reached by public transportation. These malls are of various sizes, shapes and designs. No two are identical, though they all have some common characteristics that define them as shopping malls. A common definition of a shopping mall is a large enclosed area containing a variety of stores which share a common hall or concourse and are covered by one roof. The mall is most often surrounded by a parking lot and each store has an entrance into the common concourse and the parking lot. This is the description I followed in order to find the malls and develop this project.

Because of their convenience and increasing number, shopping malls are an area that mobility teachers must recognize and utilize in their mobility

instruction. In trying to orient a client to a shopping mall, I realized that there were few systematic methods established on analyzing a large indoor environment, such as a shopping mall, for the purpose of mobility instruction.

This seminar project attempts to identify and organize the major procedures and techniques necessary to analyze shopping malls. Using this outline orientation and mobility teachers can more easily instruct their students in traveling these areas. The objective was not to explain or suggest specific teaching methods for the instructor to use with his individual students. Rather it was to outline the introductory analyzing proceudre and framework involved in preparing to teach.

Following is a step by step description of the questions and procedures that should be met in order to begin teaching a blind or low vision client how he may orient himself and travel through a shopping mall. The proceeding outline follows a general sequence. It should be pointed out that the instructor should use his judgment in applying the sequence to his lessons and make changes and combine steps when necessary for the benefit of the client and his own teaching style. The instructor should also develop some of his own questions to complete the analysis.

A thorough analysis of any area for the purpose of teaching orientation and mobility involves taking a detailed inventory of all the characteristics of the environment and noting their importance in reference to the client, his ability and purpose of travel. Developing a systematic way of identifying these characteristics was the key objective of this project. In order to do so, an outline was designed to organize the analysis. There are four major steps in the sequence of analysis.

1. Considerations of the Client
2. Teaching Considerations
3. General Analysis
4. Specific Analysis

Each step involves developing questions, analyzing and relating the identified information to the client. Before any of these steps in analysis are taken, it is important for the instructor to complete the following:

Introductory steps -

1. Contact the manager of the mall. - Identify who you are and your purpose. Call first, many managers keep limited office hours. Even after a phone call, make personal contact with the manager so that he is sure of your proposal.

2. Determine a schedule that is suitable for all concerned; your client, you and the mall manager. He may allow special hours if requested. ex. Before the mall is open to the general public.

3. Obtain a map or any free materials that may help with your preliminary analysis of the mall. ex. a basic floor plan or architect's map.
   - Ask for all available maps. At first you may just be given the general "shoppers' map" listing the stores.
   - View the map with the manager so that he may show you the details. ex. location of bathrooms, fire exits, ramps, special entrances for delivery or management.
   - Ask if there are any details not on the map.

4. Ask about a schedule of the mall's events. ex. craft shows, special sales, attractions that will cause a crowd, etc.

Additional suggestions -

- The initial contact with the manager should be open and friendly. Remember you have come to him for help.
- Let the manager tell you about the mall. He may give you additional information you could not obtain from the maps or your own visual analysis.
- Be positive. The manager may feel uneasy by the presence of you and your student. Don't ask too many questions first. You can always come back.
- Talk to the secretary for more information. They may have more time.
- Resist the temptation to analyze and teach the mall without contacting the manager. You will probably visit the mall many times during your analysis and following lessons. If you are observed "teaching" the manager may ask you to leave the area on behalf of the other patrons if he feels your instruction is in the way. Your instruction in public places should never be so obvious as to attract attention or change the regular business of the area. Once the manager is notified the security guards and other officials will also be told about your work.
- Ask for written permission so that you may present it on return visits or during lessons.
- If your teaching will eventually include lessons within a store, you must

also contact that particular store's manager. Do this in the beginning. The analysis is useless if you cannot reach your goal.

The first step of the analysis involves considerations of the client. Like any other teaching situation, the instructor must know the student in order to design the best learning experience possible. Remember, a complete analysis includes the instructor's identification, defining and evaluating of the following factors listed under each of the four major steps, in relation to your client and the area being traveled.

Step I - CONSIDERATIONS OF THE CLIENT:

A. Motivation;

- What are your client's needs?
- What is the client's purpose in mall travel?
- Why have you or the client chosen this particular mall?
- Is there a different mall you could use that would be: easier to get to, easy to travel in, best suited for your client's ability?
- Does your client want to go to this mall?

B. Evaluation of sensory systems;
- identify from clinical measurements, reports
  ex. visual acuity, field
  hearing imbalance

C. Functional ability of sensory systems;
- Identify and evaluate through observation and performance.
- Does client perform up to capabilities?
- examples of functional sensory assessment;

1. visual
   - Does your client scan in a pattern or randomly?
   - Can client identify detail? What size?
   - What colors can he see? Is he attracted to particular colors?
   - What is the client's line of vision? Where does he look while traveling? ex. floor line, straight ahead.
   - Does the client use all of his field?
   - Does the client's vision change under different lighting?

2. auditory -
   - Can the client discriminate sounds?
   - Does the client have an auditory figure ground problem?
   - Does your client recognize sounds?
   - Can the client use sound cues?

3. Coordination of sensory abilities
   - How is your client's eye-hand coordination, foot-eye coordination?

D. Previous training;
- Have you worked with this student before?
- Are there records available from other instuctors?
- Are there skills the student needs to learn before going to the mall?
- Has your client ever been to a mall before?

E. Travel ability;
- How well does your client travel; using sighted guide, cane, independently, guide dog?
- What is your client's speed of travel?
- What is the functional effect of congested areas? Congested by people, objects or noise.
- How is the client's spatial orientation, directionality and problem solving skills?
- Will travel in the mall pose a particular challenge for your client because of his ability?

F. Special Considerations;
- Identify any special personal characteristics relevant to your teaching or the area of instruction.
- Are there any emotional/psychological problems?
- Are there any relevant likes/dislikes?
- Consider the client's overall temperament.
- Will your client feel threatened by the mall? Because of the large area, sounds, crowds, lights, potential dangers? How will he react to this threat? How will the instructor react?

Step II involves some of the major instructional considerations the teacher should consider in order to design the most successful and useful learning situation for his particular client. Many of the items to be considered may not be able to be identified until the instructor has worked with the student at the particular mall. The instructor should be aware of this and be ready to make changes during the lessons in order to individualize the instruction.

Step II - TEACHING CONSIDERATIONS:

A. Considerations of the client:
- Have your worked with the client before?
- Have you established a basic teaching sequence for him?
- What is the client's learning style; rote, route, areal, linear?
- What length route can the client learn?
- What length lesson is best for your client?
- Does the client tire easily?
- How much information can the client take in during one lesson? will homework be given?
- What is the client's travel style; trailing, building line, landmark to landmark, free space, time distance, directional?

- Are there particular environmental characteristics your client will want to know about?
- Will the client need additional material, maps, tape recorded directions, memory aids, such as a list of stores or directions in the mall?

B. Considerations for the instructor;
- How much time can you spend on the analysis?
- Are there other instuctors available to teach skills needed before the client reaches the mall? ex. money skill, obtaining sighted assistance.
- Will there be other instuctors working towards this goal?
- What time of day and how often will the lessons be held?
- How long will your lessons be?
- How will the mall be taught; rote, route, areal, complete familiarization?
- Will the client ultimately travel through the mall independently or with someone? Will that person also be visually impaired?

Step III starts the general analysis of the area. Keep in mind the basic procedure of identify, define and evaluate each item in relation to the client. All characteristics of the area should be identified in relation to one or more of the following categories;

1. Sensory information - how is it perceiveed, visually, tactually, auditorally etc.?
2. Physical characteristics - size, shape, number, color.
3. Temporal conditions - When does it occur? Is it consistent? How frequently?
4. Spatial characteristics - What is the location and direction of the item?

Step III - GENERAL ANALYSIS:

A. Conditions of travel to/from the mall -

1. Available transportation; Items under analysis:
   - driven
   - taxi
   - bus
   - schedule
   - money
   - walking; use of sighted guide independently
   - time of day
   - traffic
   - traffic

2. From drop-off point to mall entrance - Items under analysis are:

Sensory;

visual
- lighting
- contrasts
- windows
- reflections
- shadows
- signs
- colors
- mirrors

auditory
- traffic flow (people/cars)
- automatic doors
- shopping carts
- telephones
- air conditioners
- sounds from within mall

Physical and Spatial;
- Location of drop-off point in relationship to;
  - traffic
  - street
  - mall entrance
  - paths
  - sidewalks
- Sidewalks;
  - width
  - condition
  - length of route to mall
  - ramps
  - walls
  - windows
  - trees
  - signs
  - fences
  - barriers
  - mail boxes
  - fire hydrants
  - length
  - configuration
  - traffic on walk
  - parking lots
  - shopping carts
  - plants
  - snow banks
  - bicycles/racks
  - phone booths
  - barbage cans
  - curbs
  - building lines

Special conditions;
- weather
- construction
- delivery of products

B. Conditions of travel in the mall -

1. General layout; Items under analysis are;
   - spatial configurationn - plus shape, rectangle, square.
   - building/store lines
   - angle of corners
   - halls; length, shape and width
   - number of floors
   - doors; number and type
   - fire exits
   - ramps

2. General characteristics - Items under analysis are;

Sensory;

Visual
- lighting
- mirrors
- colors
- signs
- store fronts
- skylights
- shadows
- reflections
- floor and wall contracts

auditory
- flow of people
- automatic doors
- escalators, steps
- clothes racks
- shopping carts
- cash registers
- over all noise
- fans
- fountains, waterfalls
- elevator bells
- public address systems
- music
- echoes

Physical and Spatial;
- location of stores
- number of stores
- stores' entrances
- types of doors
- door runners
- walls, corners, curves
- texture of walls
- floor material, linoleum, brick, tile, rug, wood
- patterns of floor
- floor seams
- ramps, gradients
- plants, trees
- pillers
- signs
- overhangs
- steps
- railings
- escalators
- benches
- islands
- fountains, waterfalls
- display cases
- display areas
- garbage cans
- shopping carts
- fire hydrants
- phonebooths
- cash registers
- fences
- booths
- ornaments

Special conditions;
- sale time
- holidays
- special hours
- contruction
- exhibits; boat shows, craft shows, blood mobile
- delivery of products

Leading to the routes of travel, step IV uses the information obtained in step III and applies it directly to the client. It is a combination of steps I, II and III in preparation for specific teaching strategies.

Step IV - SPECIFIC ANALYSIS:

A. Modes of travel to/from the mall - Items under analysis;
  1. Transportation - Identify most likely modes of travel for your client.

  2. Identify/locate the following;
     - preferred routes to mall
     - possible drop off points
     - distance to entrances
     - types of doors
     - ease of entrance
     - sidewalks
     - building lines
     - drop off point in relation to stores in mall
     - pedestrian traffic patterns
     - ease of obtaining sighted assistance
     - configuration of route to entrances
     - landmarks used by client
     - obstacles; (listed in general analysis)
     - possible cues; physical, visual and auditory
     - student's orientation ability

B. Modes of travel in the mall - Items under analysis;
  1. Specific layout - Identify the following;
     - spatial configuration of routes to be used by client
     - pedestrian traffic patterns client will come across
     - length of routes in mall
     - ability to discriminate landmarks
     - location of goals

  2. Specific characteristics for client's use; Items under analysis;
     - recognizability/discrimination of landmarks
     - obstacles (listed under genral analysis)
     - guidelines
     - cues; physical, visual and auditory
     - availability of sighted assistance
     - location of goals

  3. Special considerations;
     - client's ability to travel the area
     - speed of travel
     - number of goals
     - time and length of lessons

* It is important to decide which obstacles, characteristics and configurations may be ignored in the analysis. Always relate your analysis of the mall to your client and his goals.

FACTORS RELATED TO THE CONTEXT OF A LEARNING EXPERIENCE

A. Three sectors in a learning situation: (1) study (2) instructors (3) environment

B. Major Factors in choosing an area:

1. physical (topography, curbs, square, corners, etc.) simple to complex
2. sensory (available, reliable)
3. spatial (arrangement, amount of space) easy to difficult
4. safety
5. facilities - available & distance to (basic tech., residential, rural, business, transportation, etc.)
6. relevance - meaningful, appropriate easy-difficult
7. familiar/unfamiliar near - far

C.	Elem. (Intro.)	Intermed. #1	Advance #2
Area (environ.)	regular, small nondistract, familiar, helpful information available	regular, larger, more more trafic	congestion irregular, curve unfamiliar
Content	"Basic travel", drives, locate destinators, motor behavior, aware-sensory and environmental, crossing (perpend. and parallel)	crossings (dble.) trips, use of traffic sounds, recovery procedures, open areas, light; applic.-transfer	continu. - interme 3-4 stop signs, et solicit aid; applica.-transfer
Instructional	guided-assisted, etc.	guided-verbal, etc.	student select routes, etc.
	For each level:	1. one way, round trip 2. multi directions 3. begin diff. locations (perspective)	

#1 adding difficulty
#2 adding difficulty and/or complexity

Factors Related to the Context of a Learning Experience
Residential Travel

B.Z. Bentzen

The accompanying chart is a framework for thinking about teaching/learning independent travel in residential areas. It is intended to aid teachers in sequencing learning experiences in terms of the continua of familiar to unfamiliar, simple to complex, and maximum instructor input to no instructor input.

There is no one way to read this chart, and its content is not universally agreed upon. (For example, not all peripatologists would consider multiple street crossings to be an intermediate skill). The chart does provide some useful sequences for your consideration, however. If you attend to the structure of the chart, not just its specific content, you will find it a useful model for thinking about such other aspects of teaching/learning O&M as travel in indoor areas or business areas.

Sequential lessons may be planned by working both across and down the chart. Individual client differences and available areas will determine the exact progression. Capable students should eventually have all the experiences in the right hand column. One progression implied by the chart is as follows:

1. Elementary area, elementary content, elementary instructor input.
2. " " " " intermediate " "
3. Intermediate area, intermediate content, elemetary instructor input.
4. Intermediate area, intermediate content, elementary instructor input.
5. Intermediate area, intermediate content, advanced instructor input.
6. Advanced area, advanced content, intermediate instructor input.
7. " " " " advanced " "

FACTORS RELATED TO THE CONTEXT OF A LEARNING EXPERIENCE - RESIDENTIAL TRAVEL

FACTOR	ELEMENTARY (INTRO)	INTERMEDIATE	ADVANCED
Area (environment)	1. Regular, smooth walking surface. 2. Well defined curbs. 3. "Typical" characteristics. 4. Avaiblabe distant direction indicators(sound landmarks). 5. Easily comprehended layout(grid system)-rectilinear; small area. 6. Plus and T intersections. 7. Minimal pedestrian and vehicular congestion. 8. No large open spaces to traverse.	1. Some variety in walking surfaces. 2. Curbs either square or rounded. 3. Greater variety of characteristics. 4. Area larger, and less easily comprehended. 5. Offset as well as plus and T intersections. 6. Some open spaces to traverse. 7. One or more busy streets.	1. Varied walking surfaces, including paths. 2. Varied curbs, including blended. 3. Some "unexpected" characteristics. 4. Layout difficult to comprehend-curvilinear, and offset intersections 5. Poor direction indicators. 6. Maximal pedestrain and/or vehicular congestion(or virtually no traffic, vehicular or pedestrian. 7. Some open spaces such as gas stations or parking lots 8. Light controlled intersections.
Content	1. Within block travel-a)touch technique on sidewalk; b)reacting to drops(distinguishing between side curb and corner down curb); c)identifying and negotiating driveways; d)negotiating obstacles. 2. Application of guideline following techniques to recovery from veering into or out of driveways. 3. Application of guideline following techniques to location of landmarks. 4. Maintaining orientation and straight line of travel by attention to distant direction indicators. 5. Street crossings(single and regular plus and T)-a)line of travel; b)curb alignment; c)other architectural. 6. Constructing(remembering)mental maps of route or area actually travelled. 7. Following directions for single routes, I,L,U,S.	1. Street crossings(multiple including offset - a)perpendicular to parallel; b)parallel to perpindicular; c)using traffic alignment or squaring off; d)determining which method of direction taking to use. 2. Negotiating open spaces. 3. Application of address system to location of a destination. 4. Constructing(remembering)mental maps of area larger than the one actually travelled. 5. Planning/travelling alternate routes based on mental map of familiar area.	1. Street crossings - light controlled. 2. Interpreting map of unfamiliar area. 3. Use of map to plan routes and travel to destinations in unfamiliar area. 4. Self-familiarization to new area.
Instructor's input/ student's output	1. Instructor provides ongoing verbal instruction and physical assistance. 2. Instructor teaches student each direction taking technique and specifies which technique to use for each crossing. 3. Instructor physically protects student at drops, obstacles and crossings. 4. Instructor gives verbal and physical assistance in case of disorientation.	1. Instructor provides initial verbal instruction. 2. Student decides which type of direction taking technique is appropriate for each crossing. 3. Student is responsible for self-protection at drops and obstacles. May receive verbal assistance from instructor in dangerous situations. 4. Instructor guides student's problem-solving in case of disorientation.	1. Student familiarizes self with area, with or without the aid of a map, analyses problems in the area, plans. 2. Student is able to move from unspecified position to familiar area (drop-off) 3. Student is fully responsible for his own safety. 4. Student solves all orientation problems without instructor assistance

MAJOR COMPONENTS OF A "RESIDENTIAL" UNIT (1)

The following is intended to be in a context of awareness of self and the environment, appropriate sensory intake and processing, appropriate and planned movement; each of these operating within a defined environment.

1. "City Block"
   - a. "build" its essential characteristics/properties - (objects-sidewalks, houses, fences, poles, etc., location, direction, relationships, arrangement of objects; sensory and functional factors)
   - b. application of "conventional" travel techniques, curb detection, aligning, trailing, stair procedure, etc.
   - c. locating of objects and destinations.

2. Driveways: with and without curb

3. "Grid System"
   - a. Series of blocks in an orderly arrangement
   - b. relationship and arrangement of streets as part of the grid system

4. Street Crossing
   - a. arrangement of intersection - one street and two corners at first, then onto "plus sign", "T" and offset (include width of street and structural characteristics of corners)
   - b. traffic rules & regulations - crosswalk, stop signs, stop lines, right of way, speed, flow of traffic (stay to right, median line, one way, two way)
   - c. activity & risks - of and to pedestrians and vehicles (leading toward the decision, "where is the safest place to cross from & when?); sensory characteristics
   - d. application of crossing procedures - with & without use of traffic; recovery procedures - preventive & corrective measures

5. Routes (also see "Considerations in Formulation of Learning Experiences")
   - a. recti-linear-single direction, multi-directional, reverse routes, alternate routes (for spatial perspective) NOTE: use both sides of street
   - b. curvi-linear
   - c. consider each of the possible routes available at intersection

6. Problem solving Experiences (see sheet entitled same)

7. Other
   - a. if appropriate include curved streets, soliciting aid, crossing "open" areas (parking lots, gas stations, etc.) - located mid-block or at corners
   - b. if appropriate include system of naming streets, system of numbering buildings, difference between main (primary) streets and side (secondary streets

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(1) a conventional area; an area that is typically suburban and not country-like or semi-rural

MAJOR COMPONENTS OF A "BUSINESS" UNIT (1)

Each of the categories included as part of the item entitled, "Major Components of a 'Residential' Unit" would be applicable to this area. In addition the following factors can be considered:

1. Characteristics of a business area (in comparison to a residential area)
    a. more pedestrian and vehicular activity
    b. buildings closer and higher
    c. sidewalks and streets usually wider
    d. more parked vehicles
    e. more heavy vehicles - trucks, buses
    f. merchandise on sidewalk
    g. parking meters
    h. corners - may have more gradual curvature

NOTE: the above are to be considered in terms of their effect on sensory information and orientation-mobility procedures.

2. Destinations to locate
    a. facilities that are or will be commonly used; e.g., drug store, post office, cleaners, grocery, bakery, barber/beauty shop, florist, card/gift shop, clothing, record shop, etc.
    b. when including such destinations, consider
        1. "building" spatial and structural characteristics, physical and sensory characteristics, function - if appropriate
        2. difference between entrance and door to destination
        3. wide, multiple door entrance
        4. location of destination - end of block, mid-block, catty-corner

3. Street crossings
    a. traffic lights, multiple street configurations, rotary, three and four way stop signs, police controlled, "Y' intersections
    b. affect of parking areas - municipal, customer
    c. vehicles parked close to or into crosswalk

4. Railroad crossing

5. Shopping center, plaza, mall

6. Modifications to "conventional" procedures
    a. implementation of touch technique - due to pedestrian traffic & perhaps merchandise on sidewalk, modify cane extension, length of stride & speed of walking
    b. trailing (via sound & touch) - influenced by "irregular" features of building fronts, "flush" doors, "step up" into entrance, etc.

7. Routes, Problem Solving, Experiences - see the following:
    a. "Major Conponents of a 'Residential' Unit"
    b. "Considerations in Formulation of Learning Experience"
    c. "Problem Solving Experiences" "Process vs. Product"

(1) Examples of business areas considered in terms of size, volume of activity & complexity:
"introductory" - neighborhood center, 1-4 blocks, single level buildings
"intermediate" - e.g. south end of Waltham center
"advance" - e.g. total Waltham center
"Central City" - e.g. Boston

"Rural/Suburban Unit"

A. Characteristics of "rural/semi-rural/rural like" area compared to a "conventional suburban" area with regard to environmental information:

   1. not as much; e.g., people, vehicles, etc.
   2. not as regular; e.g., curves, diagonals, etc.
   3. not as consistent; e.g., variations in walking areas, pavement, road properties, etc.
   4. not as distinctive; i.e., physical/sensory data
   5. buildings - farther apart and set farther back from "sidewalk"
   6. "blocks" - longer, inconsistent due to irregular grid, more "T" intersections
   7. More trees

   1. NOTE: consider affect of above an available/useful sensory information and the navigational process.

B. The components (Objectives, content, sequence, principles, procedure for this unit are essentially the same as these for a conventional residential unit with additional consideration to the following:

   1. techniques - procedures: refer to those with regard to travel/ steeet crossings in areas with no sidewalks
      a. crossings at cross bar of "T"? mid-block?
      b. walk "against" traffic?
   2. greater attention by blind person to clues for location, direction, relations; greater use of landmarks, trailing.
   3. differential identification of street vs. driveway vs. walk
   4. systematic investigation is critical
   5. selective attention is critical
   6. affect of weather: on guidelines, landmarks, footwear, walking areas; etc.

C. Miscellaneous

   1. Use of dog guide and/or electronic aids
   2. lessons-consider going to a simpler-easier area for early learning experiences
   3. identify sources of assistance

FRAME OF REFERENCE FOR ANALYZING AN INTERSECTION

The following is designed to the utilized by an instructor primarily; however, depending upon the capabilities of a blind person, it might be appropriate for his/her use also.

NOTE: Intersection is considered to include the streets plus sidewalks/ buildings/lots bordering th streets.

1. Spatial Components: organization, dimensions, relation to reference system.
2. Sensory Information: available, useful; sound masking, sound shadow.
3. Physical/Structural Characteristics and Objects: curb line, building line, landmarks, etc.
4. Traffic Control System: Type of, location; length of cycle; crosswalks; stop lines; pedestrian walk system; islands
5. Activity: pedestrian; traffic-pattern (turns, one-two way street), type, speed, amount (time of day); frequency of deviations from "rules"; etc.
6. Techniques/Procedures Suited for Area; Protective technique, orientation, direction taking, crossing, (independent, assisted; differentials due to direction or side of street), sources of aid, locating objectives
7. Risks--identify these in #1-5 above; Can they be reduced? How? Are they reasonble? Critical?

JUDGEMENTS TO BE MADE AT A STREET CROSSING

1. direction: via approach, guide line, sensory clues
2. location: via landmarks, sensory clues
3. location of far corner: directly in front? offset? etc.
4. width of crossing: via structure of curb, sensory clues
5. traffic control: stop signs, traffic lights, policeman
6. configuration of intersection: activity pattern of vehicles
7. traffic speed: fast, slow, medium
8. road conditions: weather factor, (wind, rain, etc.)
9. sound shadow: sound masking
10. curves/hills: affect re: blockage, starting cue
11. selective listening regarding lane activity

Note:

the above are applicable to partially sighted but add -
visual blockage/masking (#9)
selective looking/masking (#11)

generally use sight and sound

"SNOW" TRAVEL

1. See article: Rudkin, S.W.: "Cane Travel in Winter", New Outlook, January 1971.

2. Some of same difficulties in a "rural" setting apply: irregular, inconsistent, reduced, etc., information. (Clues for location, direction, relationship probably are reduced, distorted, hidden).

3. Problem of identifying corner-street-driveway-landmarks-guidelines, etc.

4. Any significant/sudden change of walking surface, stop and explore street? Drive? etc.

5. Footing: shorter stride, flat footed, non-slip soles

6. Walking conditions

    a. during a day or two following a snowfall: inquire as to accumulation and clearance; get assistance.

    b. couple days after: inconsistent snow removal, snow banks, cluttered corners, primary streets cleared to pavement.

    c. conditions in different areas: residential-conventional, rural, business areas, etc.

NOTE: suggest a walk through familiarization - "feel" of snow-ice underfoot, cane contact, etc.: exploratory procedures; trailing procedures; affect of snow on availability of sensory information (e.g. sound)

SUGGESTED ACTIVITIES - INCLEMENT WEATHER

(Application depends on: need and capacity of blind person, facilities, time limitations, delineation of professional and agency responsibilities, etc.)

1. Review indoor techniques: stairs, diagonal cane, etc.
2. Travel in inclement weather; experience effects of rain, wind, snow, cold
3. Motor/sensory exercises:
    a. Body awareness, body positions, veer, turn, sidestep, gestures, mannerisms, etc.
    b. Tactual activity - exploration and identification of object and maps
    c. Sound - listening habit, awareness, identification, localization, alignment, pattern, reflection (with and without masking a elements)
    d. Sensory tours
4. Imagery activities: use of maps, tactual and verbal puzzles, color prose
5. Travel:
    a. Aids - kind and sources of canes; dog guides; elctronic devices
    b. legislation - travel concessions, white cane law, etc.
6. Activities of Daily Living
7. Concept Development - spatial; object
8. Experience community facilities - drug store, post office, bank, cleaners, barber shop, beauty shop, shopping, restaurant, theatre, first station, police station, taxi stands, outdoor telephone booths, etc.
9. Informal meeting - discuss application of travel to blind persons present or planned activities; observe how blind person handles himself in his household, etc.
10. Spatial Orientation Exercises
11. Day Off

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